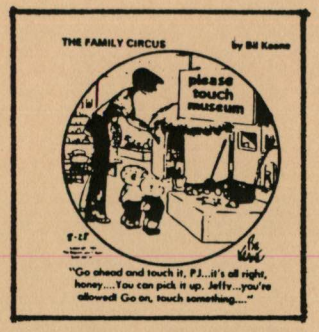
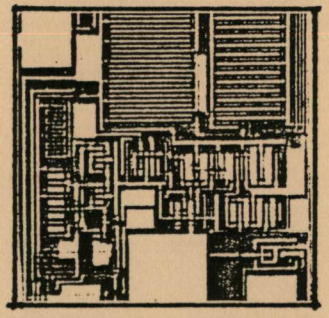
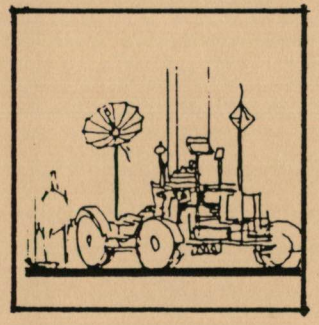
5-1986

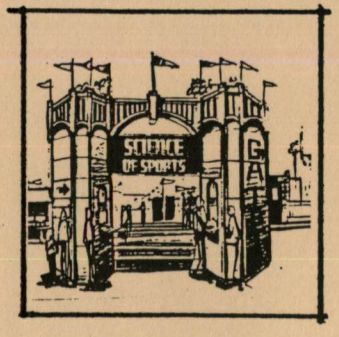
Space Coast Science Center - Melbourne, Florida

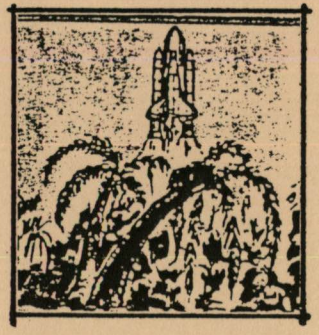
D. Wayne Rogers
Clemson University











SPACE COAST SCIENCE CENTER

SPACE COAST SCIENCE CENTER
Melbourne, Florida

[redacted]

D. Wayne Rogers
Spring 1986

A Master's Design Project submitted to the faculty of the College of Architecture, Clemson University, in partial fulfillment of the requirements for the degree of Master of Architecture.

[redacted]

Yuji Kishimoto, AIA, Committee Chairman

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Peter R. Lee, AIA, Committee Member

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Dr. Teoman Doruk, Committee Member

[redacted]

John Jacques, AIA, Acting Head, Department of Architectural Studies

[redacted]

Lamar Brown, PE, Acting Dean, College of Architecture

To Jill, my wife, critic, counselor, encourager, and companion,
I affectionately dedicate this work.

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to the following people for their generous contribution to this effort:

Jill, who made all the sacrifices.

My father, C. O. Rogers, Jr., AIA, who has given me a love for architecture, and who, together with my mother, Ellen Sue Rogers, have always given me love, encouragement, and support.

Bill and Evelyn Corry, my father and mother "in-law," who have also given me constant love, encouragement, and support.

The Board of Directors at the **Space Coast Science Center,** especially to Joseph Keller, Ed. D., President; Linda J. Laibl, First Vice President; Jennifer G. Marx; and Judy Law. Without their vision and contribution this project would not have been possible.

Robert Gabriel, Museum Executive Dirtector, Brevard Art Center and Museum, for his insight into the Eau Gallie district as the cultural center of Brevard County.

Freda Nicholson, Chief Executive Officer, Science Museums of Charlotte, Inc., architectural program consultant.

Erik Speyer, Executive Director, Museum of Science, Miami, Fl., for his input into the architectural program.

Dr. Teoman Doruk, committee member, for his words of encouragement.

Peter Lee, AIA, committee member, who taught me to search for excellence in design.

Yuji Kishimoto, AIA, committee member, who taught me to challenge myself and who helped make this project rewarding.

ACKNOWLEDGEMENTS

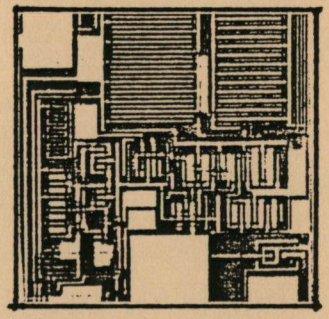
Roger Liska, PE, structural consultant.

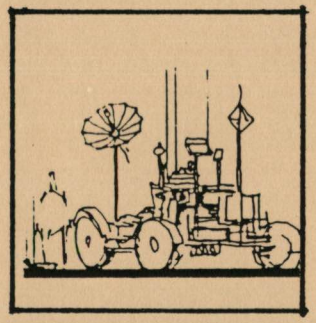
To my colleagues for their critiques, encouragement, and companionship, especially Doug Ferguson, Glenn Lattanze, Bill Platts, John Robinson, and Amy Spitzmiller.

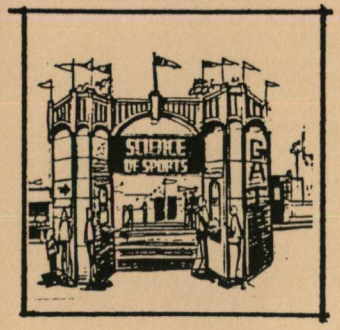
And to Scott Baker, Butch Birchfield, Kelvin Rogers, Ana Covington, and Jill (again) for all their help.

CONTENTS

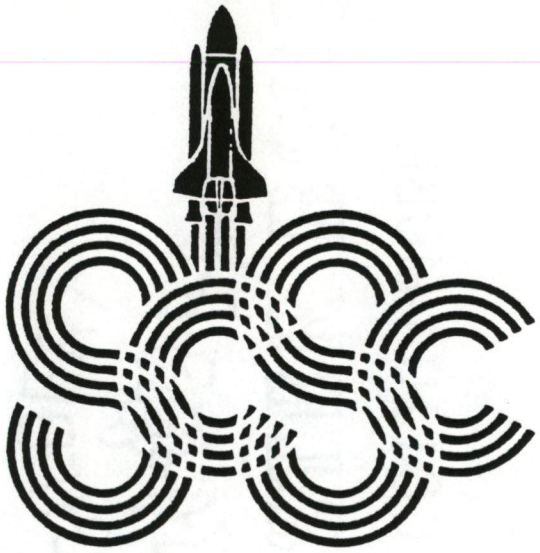
CONTENTS







PROJECT STATEMENT



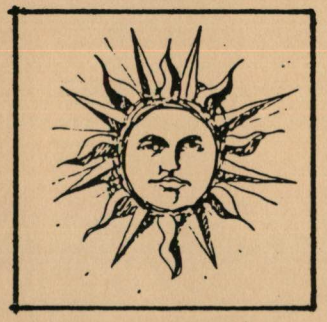
PROJECT STATEMENT

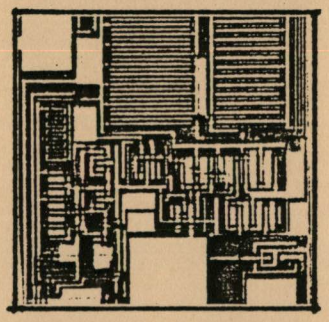
In 1969 the South Brevard County cities of Melbourne and Eau Gallie, Florida merged to form the city that is today known as Melbourne. As a result of that merger, Melbourne is left with two downtown areas, downtown Melbourne and downtown old Eau Gallie. In recent years there has been concern expressed about the decay of these areas and some downtown revitalization efforts have begun. These efforts in downtown Melbourne, planned to be the buisness center of the area, are continuing, but due to perhaps poor planning, and/or communication these efforts have been abandoned in the Eau Gallie area.

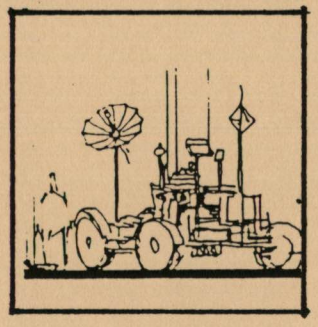
The Eau Gallie area, however, offers much potential for becoming the cultural focus for the city and county. Located at the base of one of just two bridges connecting Melbourne to the barrier island, it is currently home to the art center and museum, antique shops, art galleries, a civic center, and a branch of the library.

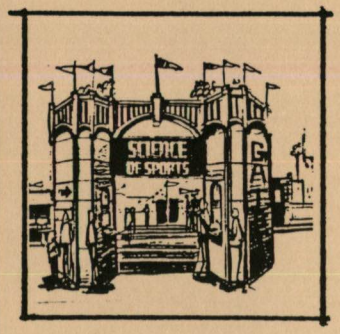
As a result of Melbourne's natural resources and the continued expansion of its "high tech" industry, Melbourne continues to experience dynamic growth. In order, therefore to meet Melbourne's need for, and interest in, science education, the Space Coast Science Center has become the area's most recent cultural addition. This group intends to showcase the region's natural resources and its role as a leader in "high tech" and space related industries, as well as provide educational opportunities in the science field for the community.

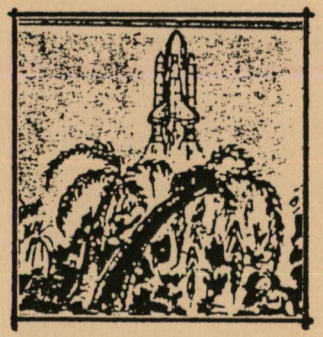
This project shall concern itself with the design of a hands-on science center for the Space Coast Science Center. Because architecture should always be studied in its next larger context and due to the unique potential of the Eau Gallie area, the project shall also consider the urban planning of the area as a cultural focus for the county.



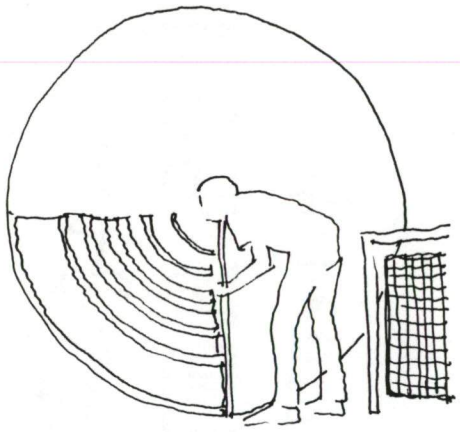


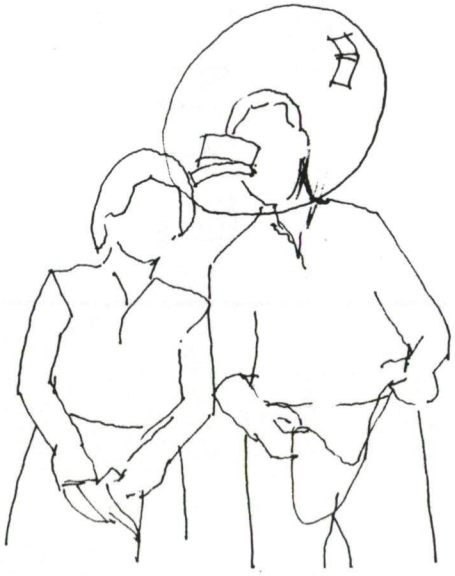






BUILDING TYPE

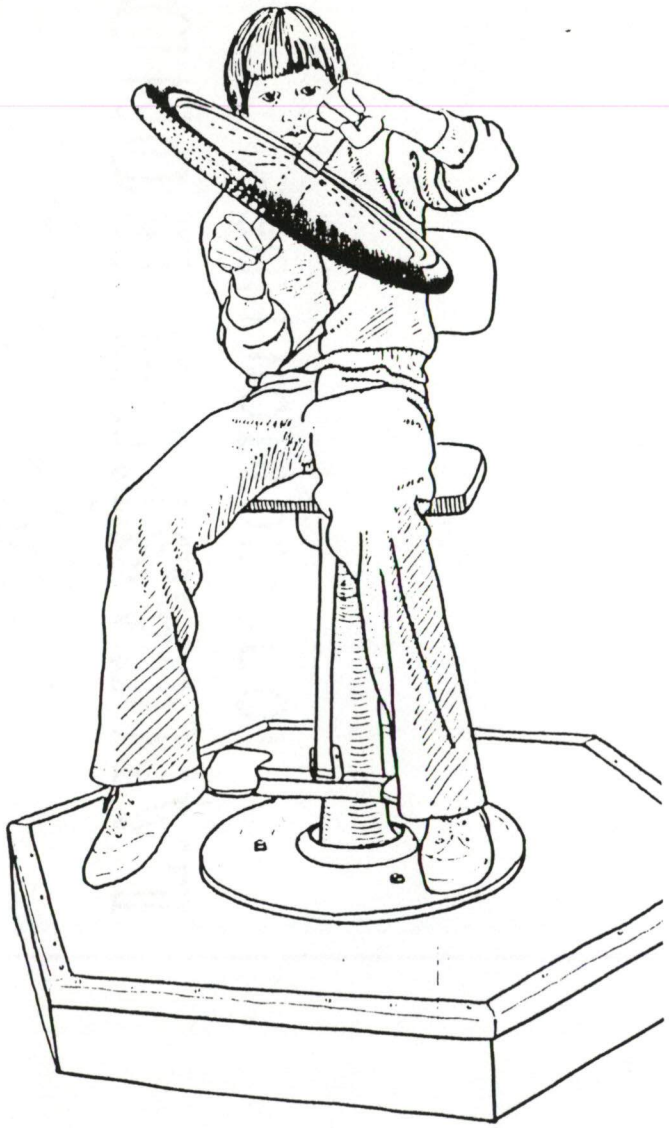




The museum's role in the past has been concerned with collecting, caring for, and exhibiting our culture's most prized objects. In recent years, however, there has been an increased awareness that museums can be utilized as educational tools. This is due to a growing group of museums that are "experience oriented" as opposed to those that are "object-observation oriented." As opposed to traditional museums "they are not object oriented, and they usually do not have curators, conduct research, or publish learned papers. They are basically contemporary, participatory, informal education instruments."(1) They are filled with innovative exhibits that are aimed at creating an enjoyable educational experience. The concept at the root of this approach is that the visitor can learn more through a "hands on" experience in which he actively participates.

These "hands-on" science and technology centers are primarily concerned with furthering the public's understanding and awareness of the physical and life sciences, technology, engineering, industry and health. Some traditionalist question whether these center are really "museums" since they often do not contain collections, but they instead refer to these "hands-on" centers as "scientific Disneylands."

Despite such skepticism, science centers are growing rapidly and have filled the need of providing a facility to channel science education and technological developments to school children and the public in an understandable, interesting, and meaningful way. Even though in 1981 there were only thirty comprehensive science and technology centers and seventy partial science centers compared to the 5500 American museums listed in The Official Museum Directory, they were among the most popular and successful museum type. A survey showed that 45 percent of all museum visits were to science museums (including science centers, natural history museums, and other science oriented museums), 24 percent to history museums, and 12 percent to art museums.(2)



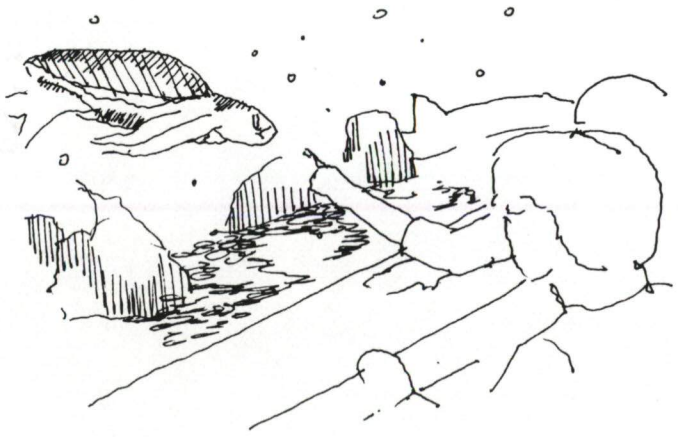
The hands-on concept of museums is a responce to the changing attitudes of the museum visitor. Kenneth Hudson, who has studied the trends of museums, has observed in his book on these trends that:

> "During the past 25 years especially, the museum-going public has changed a great deal, and is still changing. Its range of interest has widened, it is far less reverent and respectful in its attitudes. It expects to find electronic and other modern technical facilities adequately used, it distinguishes less between a museum and an exhibition, it considers the intellect to be no more prestigious or respectable than the emotions, and it sees no reason to pay attention to the subject-divisions and specialisms which are so dear to academics." (3)

In recent years the popularity of science centers has grown to an annual attendance of about forty million people. Of these, about half, or twenty million, are children, usually in upper elementary or junior high school grades. In addition, forty to fifty percent of a community attend science centers annually. Therefore, the growing numbers of science centers in metropolitan areas present a tremendous potential for contribution toward the science education of the community.

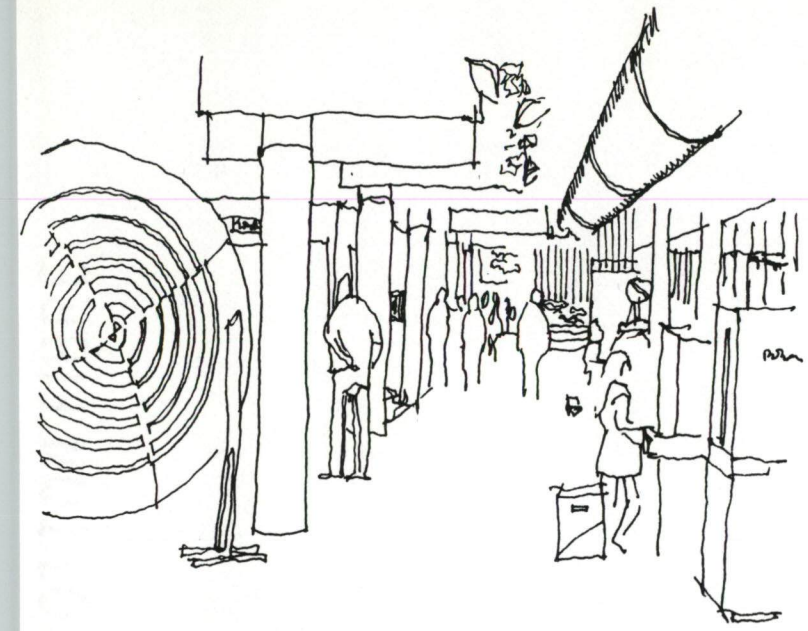
In studying group behavior in a science center, studies show that most people in groups will not read the instructions to an exhibit before attempting to interact with it. Instead, visitors often share information and attempt to help one another to understand the exhibit. Therefore, one can observe that an important relationship exists between social interaction and scientific learning activities.

SCHOOL GROUPS



In the past, most teachers have viewed class trips to a science center as they would most other field trips: the main emphasis and learning experience for the children was thought to be the social interaction in a new environment, not a continuation of classroom learning. Children seem to most often move through the museum in groups of two; but the learning is highly individual and a major part of a child's visit to a science center. In a study, two hundred children reported almost five hundred discoveries made during a field trip.

A child's behavior has a definite progression during his visit to the science center. They move from observing and touching activities to manipulating and analyzing activities to more creative activities. Manipulative exhibits, as opposed to the more static activities, seem to attract more children, hold their interest longer, and have a stronger impact on their memory. Because of the importance of curiosity and exploration of a particular exhibit, it is important that science centers



be a "free choice" environment where the children are free to roam around on their own schedule.

FAMILY GROUPS.

Science centers are particularly popular with family groups. Because there is active participation in the exhibits, there is something for everyone in the family. "Having a good time" is the basic objective of this group, but the active participation in the exhibits increases the opportunity of social interaction between the family members. Family groups actually spend only about half of their time in the science center participating in the activities, with the balance spent in social exchange.

TOURISTS.

Due to the number of tourists who visit the area and the anticipated popularity of the science center, especially in the cultural center of a technologically oriented city, tourists should become active users of the facility. The behavior of the tourist will be very much like that of the family group with, perhaps, more expectations that those sciences that are so much a part of the South Brevard County area will be a significant part of a science center in that area.

SOCIAL GROUPS.

Due to the need for opportunities to raise funds and the ability of a science center to provide entertainment for corporate parties, the science center will be rented by corporations for social functions. The unique need of this group is room to set up refreshments and have a gathering space for people to socialize who are not observing or participating with exhibits. The group will, however, while socializing inevitably observe and interact with the exhibits.

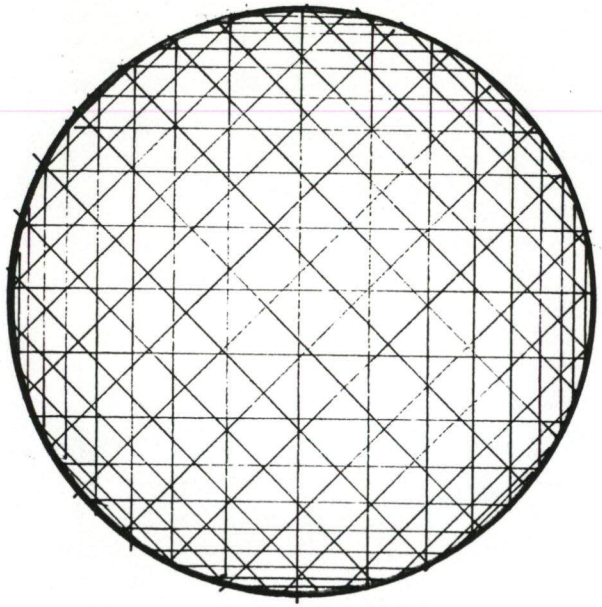


IMAGE. SCIENCE CENTERS

In evaluating the science center and its architectural image, it is important to understand the development of the museum as a building type and the development of science centers within that building type. Traditionally, museums have been concerned primarily with the collecting and exhibiting a cuture's most prized objects. In its beginning, the museum was a palace, such as the Louvre. It was a quiet, meditative place where one went to observe art. Because it was understood as a palace, no one objected to its functional inconveniences. The development of museums continued from the first American museum to survive its adolescence, the quiet, classical Trumbull Gallery at Yale, to the active, exciting National Air and Space Museum in Washington, D.C., where the Spirit of St. Louis hangs aloft. These extremes represent the extraordinary leaps that have taken place in the evolution of museums, from showcases to participatory learning centers.

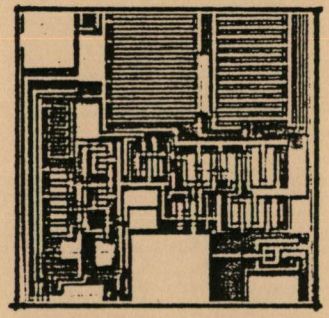
The image role that the science center will serve in the community is similar to the role of a museum in a community. It will be a symbol of the community's resources, pride and aspirations. The museum today, has found itself in a place of public meaning and pride. In that regard, the museum represents a community's resources, character, and accomplishments today in the way that the cathedral has historically represented a community's aspirations and values.

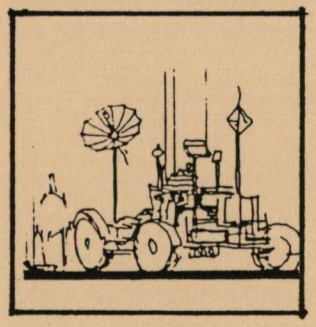
The visit to a science center should be a learning experience, but it should also be a memorable event that conveys an image of the area that it represents, in this case, the 'Space Coast.' To the visitor, the image that is expressed by the science center should be the same image that is associated with the community. The image that is conveyed by the built form of the Space Coast Science Center should express the uniqueness of the "Space Coast", i.e. the high technology industry including the space program located in a relatively pristine environment. In this regard, it should speak of place. This is particularly

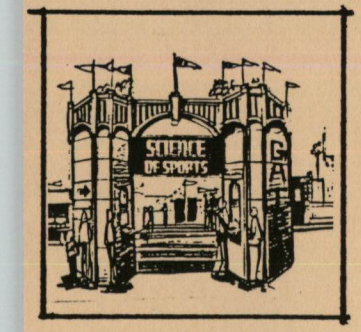
important when one recognizes that the image that the Space Coast Science Center conveys to the tourist visitor will influence greatly his image of Melbourne and the 'Space Coast.' The building has the opportunity to be the largest 'exhibit' of the science center, expressing not only the science of the building, but the science of the area.

In today's economy it is not unusual to have firms which can move and relocate in any area of the country. In particular, as Melbourne continues its growth as a "high tech" center, the number of technological firms looking to locate their company in the area will increase. As the heads of these firms evaluate Melbourne as a possible location, they will look at many different factors. Of these, the most important determinants is the city's quality of life. Its amenities, such as a science center, play a large role in the development of that amenity package.

According to a study of a Philadelphia museum that had 100 out-of-town visitors per day, the museum generated about 1.2 million dollars of increased retail sales per year and about 100 new industry related jobs. Of particular interest was that for every seven dollars that were spent on a cultural event, an additional $5.60 was spent on ancillary services. The additional retail revenue could be particularly significant for Melbourne in general and the Eau Gallie area in particular, due to the tourist industry of the area and the regional audience for the science center.



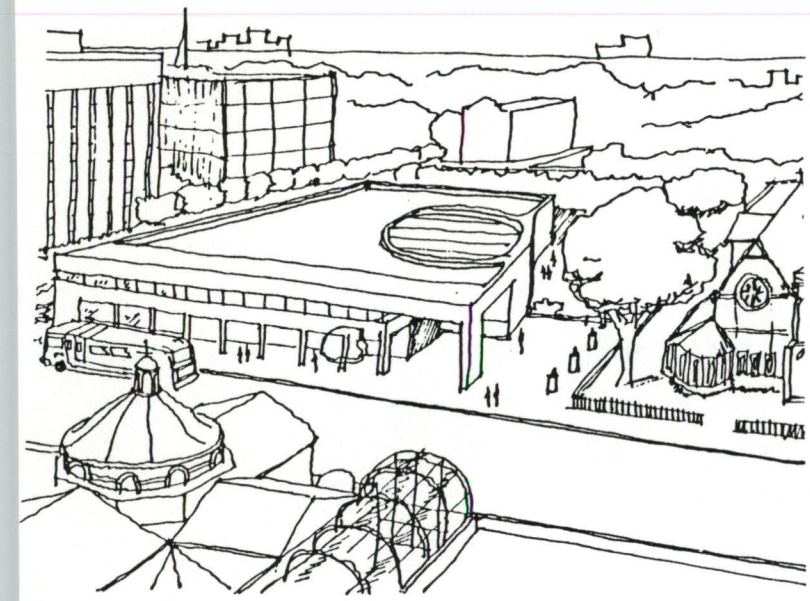




CASE STUDIES

DICOVERY PLACE **CASE STUDY**
Charlotte, North Carolina

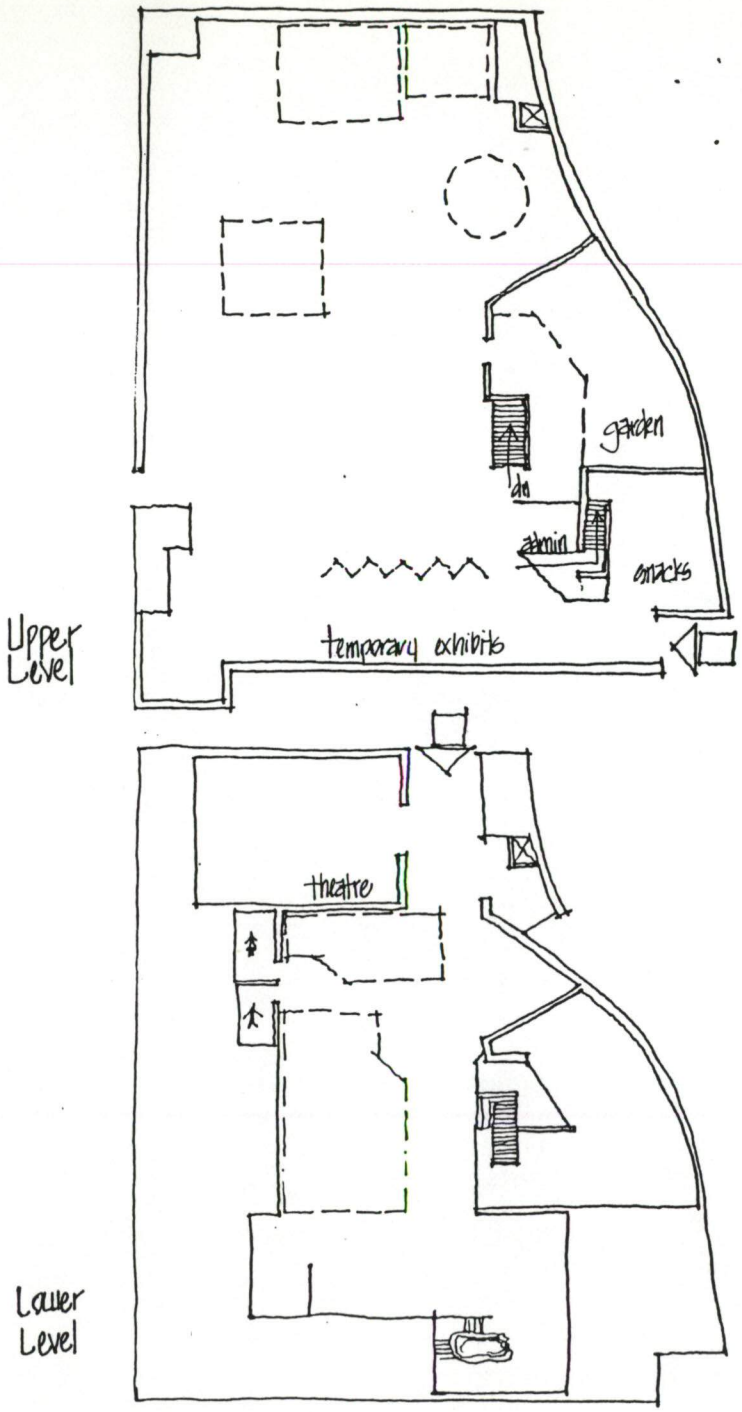
Architect: Clark Tribble Harris and Li, 1982



Discovery Place is a 72,000 square foot "hands-on" urban museum of science and technology. The building is a rectangular form except for an "S" curved wall on the north side of the building. On the exterior, in a future phase, this gently curving facade will simulate the layering of geological strata from North Carolina's mountains to sea, and border an outdoor water park with exterior exhibits.

Glass was used on the front of Discovery Place in order to allow people on Tryon Street to observe the activity inside of the science center, a characteristic of "old main street" when a passerby could observe a craftsman working at his trade. In reality the glass is too tinted to allow good visibility in and the daylight level inside is too much for some exhibits. The "main street" entry on Tryon Street is used as the drop off entry for students arriving by bus. The students then exit the facility after their visit through the rear, lower level exit, thus avoiding congestion at the Tryon Street entry. Family groups arriving at the science center often park in the rear and approximately eighty per cent of them use the rear entry. The two entry system work well for school groups but does complicate the receiving of other visitors.

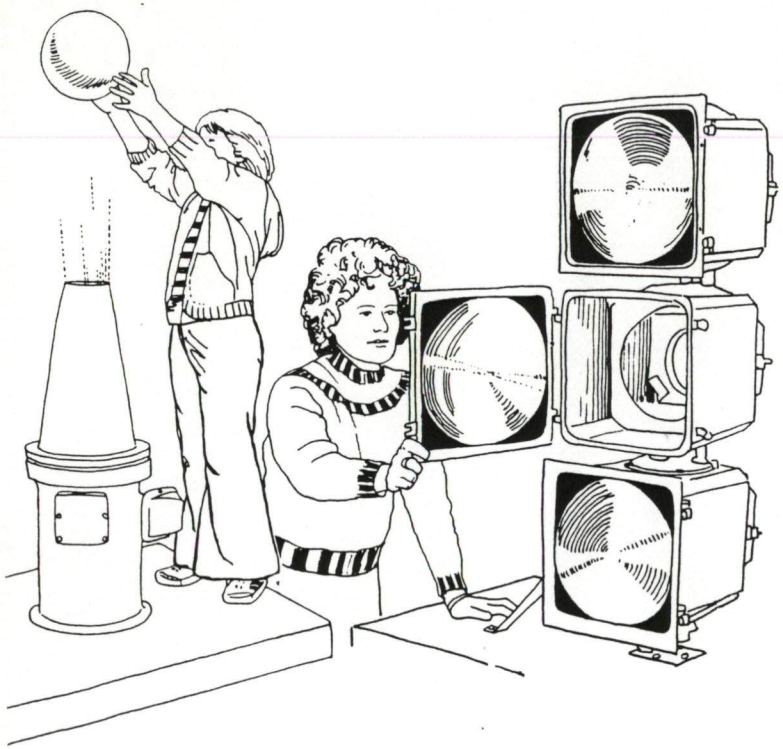
Discovery Place is located in Mecklenburg County with a population of about 400,000. The annual attendance at the science center, however, is over 300,000 people with more than 50% of those being adults. Approximately 90,000 students in school groups attend classes and programs at the science center, with 61,000 of those coming from outside of Mecklenburg County. A museum staff of seventy, with 470 volunteers, man the museum with its following exhibit areas: Knight Rain Forest, Aquarium, Collections Gallery, Trading Post, Energy, Life Center, Science Circus, Science Theatre, Natural Gas Hearth, World and Me, Science Shop, and Temporary Exhibits/Special Events.



CASE STUDY

The facility was designed to allow for future expansion and some of that expansion will begin soon as a 10,000 square foot addition to provide for more exhibit space is built. Discovery Place recently acquired the 12,000 square foot Clark, Tribble, Harris, and Li building to house the silk screen shop, the graphics department, development, accounting, and other support personnel. The final phase of expansion at Discovery Place, scheduled to open in 1990 will add another 50,000 square feet of exhibit space and a space theatre.

Dicovery Place won the 1983 Nisbet Award, given by the Travel Council of North Carolina to the attraction which did the most to promote tourism in the state.



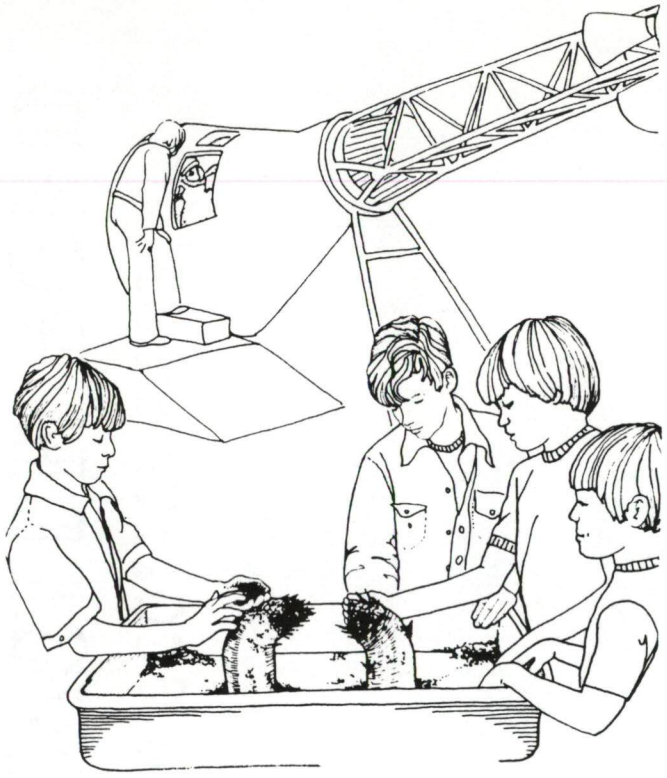
THE EXPLORATORIUM **CASE STUDY**
San Francisco, California

Palace of Fine Arts
1915 Panama-Pacific Exposition
Architect: Bernard Maybeck

> "The Exploratorium was conceived to communicate a conviction that nature and people can be both understandable and full of newly discovered magic. It therefore provides experiential opportunities for learning that are difficult, if not impossible to achieve through school classrooms, books, or television programs. The Exploratorium is not a substitute for other vehicles for learning, but it provides a fascination with learning that cannot be found elsewhere and which facilitates traditional teaching at all levels."
>
> -From the Statement of Broad Purposes

The Exploratorium is housed in the restored Palace of Fine Arts, a neoclassical structure built for the 1915 Panama-Pacific International Exhibition. Opening in 1968, the Exploratorium identified itself as a perceptual museum that invited its visitors to learn through participation and exploration.

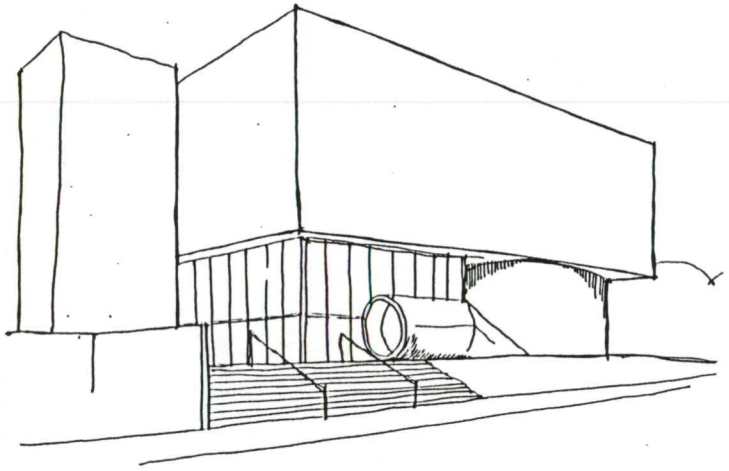
The 90,000 square foot exhibit space resembles an airplane hanger in that it is a simple open warehouse. The barrier free space is roofed with steel trusses that span over 100 feet. The cold, gray, drabness of the space is not noticed however due to the more than 400 exhibits that flash, beep, and twinkle. The big space, with asphalt floors and concrete walls, free of barriers, except for the exhibits themselves, encourages the visitor to explore and learn at his own pace, based on his own curiosity. The space is loosely arranged into eight different



sections: light, color, patterns, eye logic, the third dimension, sound and hearing, electricity, and the "Tactile Gallery."

The visitors are allowed visual access to the shops to watch the craftsman work. Unlike other types of museums, the exhibit workshop is not a behind the scenes activity, but is brought out front, thus making it an exhibit itself. The constant construction and change that are part of the nature of the museum are thus evident to the visitor.

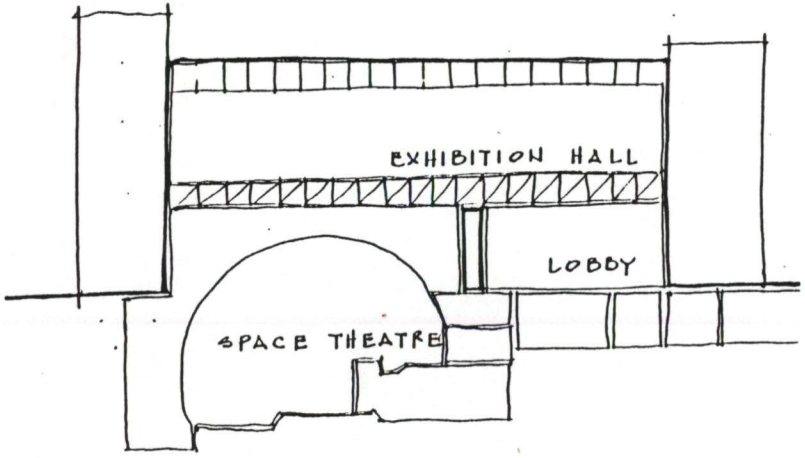
DETROIT SCIENCE CENTER **CASE STUDY**
Detroit, Michigan



Architect: William Kessler and Associates, Inc.

The Detroit Science Center, a 35,000 square building, is part of the Detroit Cultural Center which includes the Institute of Arts, the Center for Creative Studies, Public Library, State University, and other cultural institutions. The structure that is built represents only one-twentieth of the size of the master plan. Future exhibition halls will be added in the same geometry and character as the present building.

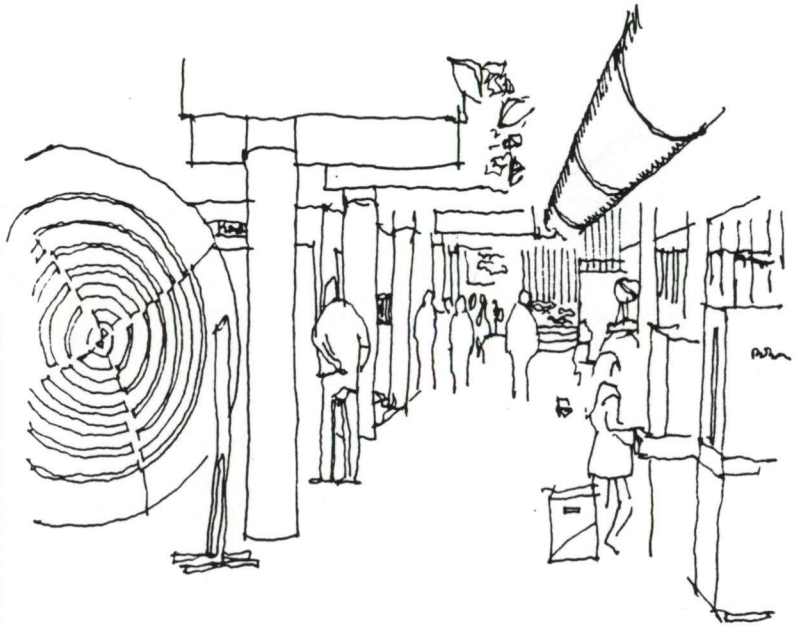
The three major interior fuctions of the science center had very different spatial requirements: the exhibit hall needed to be large and windowless, the lobby needed to be open and inviting to visitors, and the theatre needed to have a high dome. These three spaces are, therefore, well articulated in the exterior form with the Space Theatre being mostly below grade, the lobby occuring on the plaza level, and the rectangular, column free exhibit area occuring on the second level.



One of the unique spaces in the science center is the Space Theatre. It is a planetarium with a hemisphere 67 feet in diameter and the floor tilted at a 20 degree angle in order to have all of the seats directed toward the curved ceiling. The most visually exciting space in the museum, however, is the escalator "tube" that leads down to the Space Theatre. The tube is lined with linear panels with neon tubes of different colors running in the grooves between the panels. The feeling that is created passing through this transition space is a "high tech" image that is very appropriate for a science center.

MIAMI MUSEUM OF SCIENCE
AND SPACE TRANSIT PLANETARIUM.

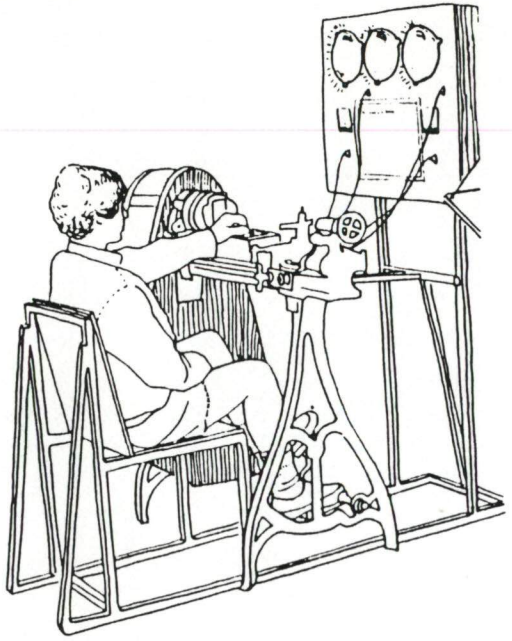
CASE STUDIES



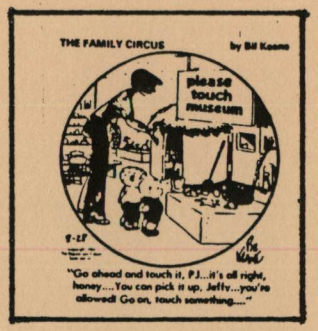
Several years ago the city of Miami was known as a "cultural wasteland." Today the outlook is brighter as the city moves toward becoming a international banking and trading center, with a thriving cultural atmosphere. A contributor to this cultural revival is the Miami Museum of Science and Space Transit Planetarium.

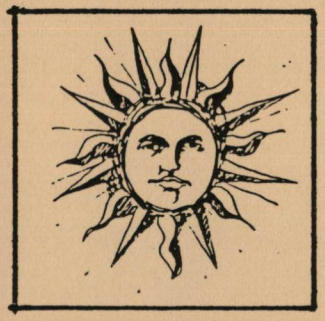
The museum contains a 13,000 square foot exhibit space with about 100 exhibits divided into three rooms. These "black box" exhibit spaces are arranged linearly with classrooms and suport spaces to each side. The movement through the museum is somewhat confusing because, despite the linear arrangement, there is only one entry/exit. Eric Speyer, the museum director, explained that having the classrooms and administration space on the exterior to use light is good, but being forced to circulate through the exhibit space to reach them is a problem. The entry lobby serves as the entry point also for the planetarium that is operated completely separate from the museum. Eric Speyer also stressed the importance of support and storage space. He reccommended that the ratio of exhibit to storage should be about 2:1.

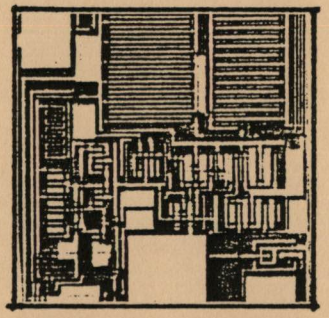
In addition to the 100 hands-on exhibits, including a special section on the body and health, one can observe and interact with an array of major national traveling exhibitions and see live demonstrations. There is also an Animal Exploratorium with insects, birds, snakes, and a marine touch tank. The Education classrooms offer classes every night of the week for adults and children and conduct school visits for nearly 40,000 students annually. There is also a Computer Learning Center where one can learn programming and graphics.

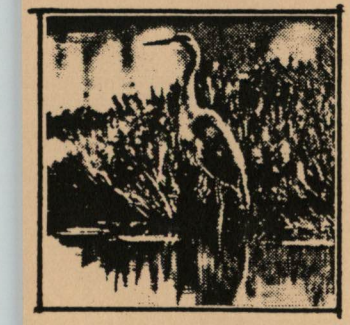


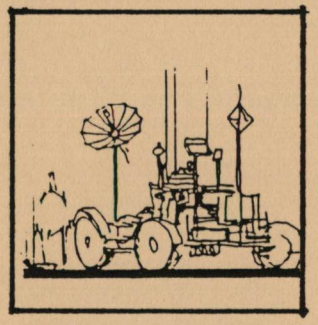
The museum is presently planning a major expansion to accommodate its users. Last year 350,000 people attended the museum, of which 60% were adults, making this museum a major draw in Florida. The planned expansion is also concerned with renovating the exterior canopy that leads along the building from the parking to the entry. Presently the entry to the museum is not well articulated and must be identified with graphics.

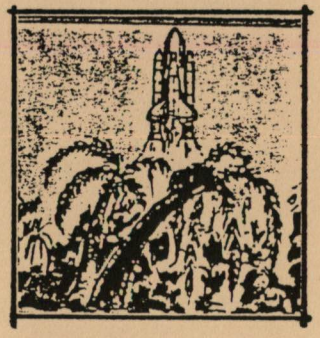




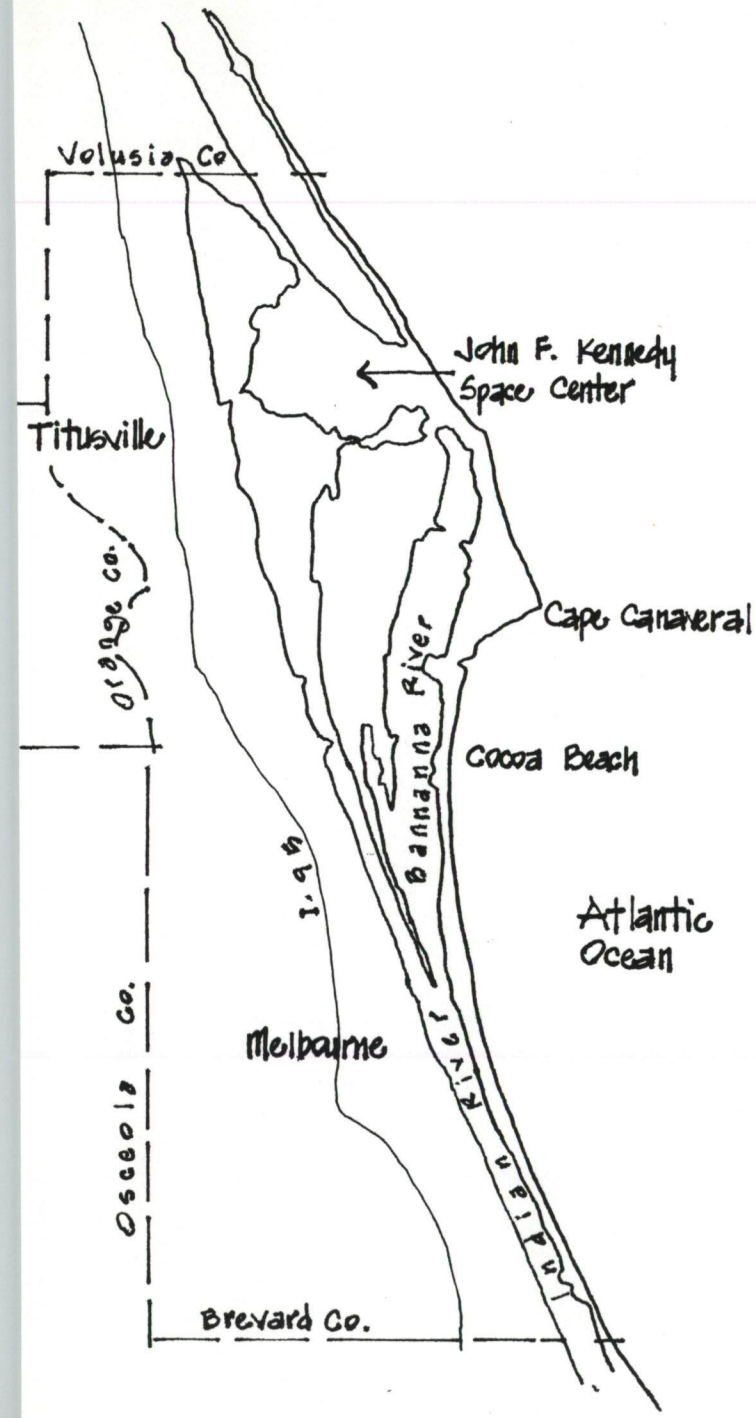








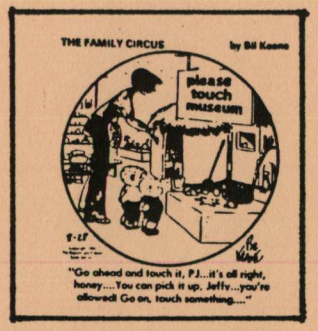
THE SPACE COAST

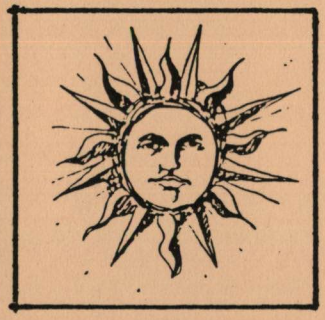


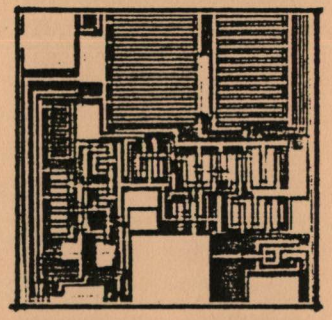
THE SPACE COAST. **REGION**

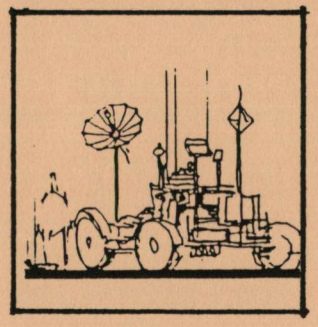
Serving as the nations gateway to space, Brevard County, Florida, has been dubbed the "Space Coast." Located halfway between Jacksonville and Miami on Florida's east coast the area serves as home to the Kennedy Space Center,to its customers and contractors, and to other space related industries. As is implied by its name, it is the intention of the Space Coast Science Center to serve the entire Space Coast and its tourists. When Brevard County swapped its citrus groves for rocketships more than 25 years ago, the areas fortunes skyrocketed. The Mercury, Gemini, and Apollo programs of the 1950s through the early 1970s brought many space related firms as well as the world's attention and tourists to the area. Then in the mid-1970s, when much of the funding for space exploration was removed, the area industry diversified into other technical fields, such as communications and computers. Today, a partnership is being built between business and space exploration due to the growth of the shuttle program and the plans to develop a permanent space station. All of this means a technological boom for the Space Coast. As high technology firms continue to discover the advantage of being located near the "gateway" to space, the areas reputation as the "technology capitol of the southeast" will continue to grow.

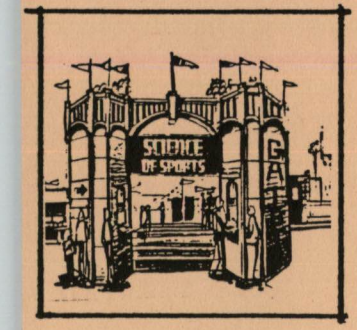
Due to the Space Coast's scientific and technologically oriented population and industry, the atmosphere is excellent for a hands-on science center. The science center will also be able to attract the attention of the tourist who come to the area to satisfy their passion for space. In addition to serving as an informative and challenging learning center for the area's residents and tourists, the science center will have the opportunity to showcase the area's technology and natural resources.

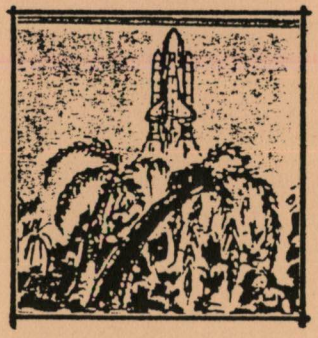




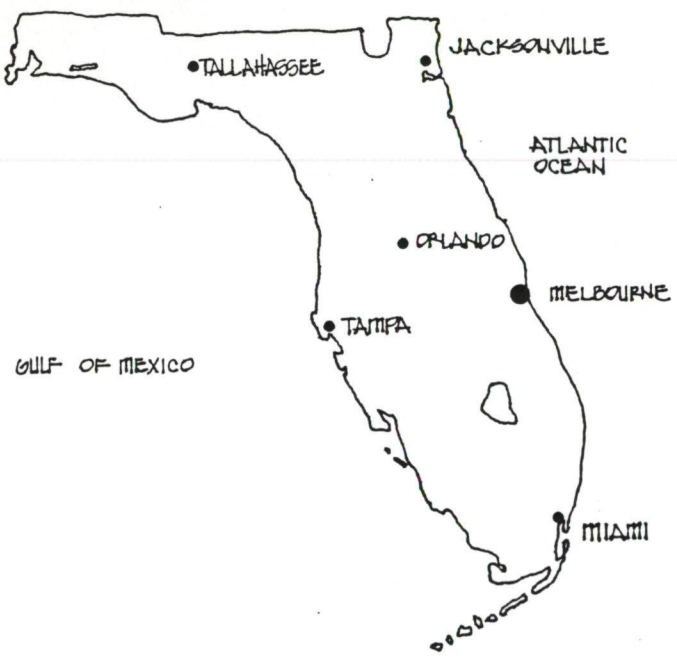








THE CITY : MELBOURNE



MELBOURNE METROPOLITAN AREA. **THE CITY**

The Melbourne metropolitan area, the largest city on the Space Coast, is located on the east coast of Florida in south Brevard County. Melbourne is a progressive industrial and recreational city. It has, as a reflection of the space program, experienced rapid growth in the fields of high technology, electronics, and communication A reflection of its rapid growth can be seen in a recent rating in which Melbourne is rated as the twenty-first fastest growing metropolitan area in the country and the only city in Florida to have the corporate headquarters of two Fortune 500 companies.

HERITAGE.

Civilization first came to Eau Gallie in 1859 and to Melbourne in 1875 when settlers were traveling old Indian trails camped in the area and were so impressed with the natural beauty of the area that they built homes. The communication between the two cities was mainly by boat on the river. In 1870 Florida State Agricultural College was built in Eau Gallie. In 1876 the college was cancelled and moved to Lake city and eventually to Gainesville where it became the University of Florida. In 1887 the railroad was extended as far south as Eau Gallie. The construction of the railroad, its terminus in Eau Gallie and its promise to stop all trains in Eau Gallie created a boom in the town and developed a business in the area south of the railroad spur and along the Indian River.

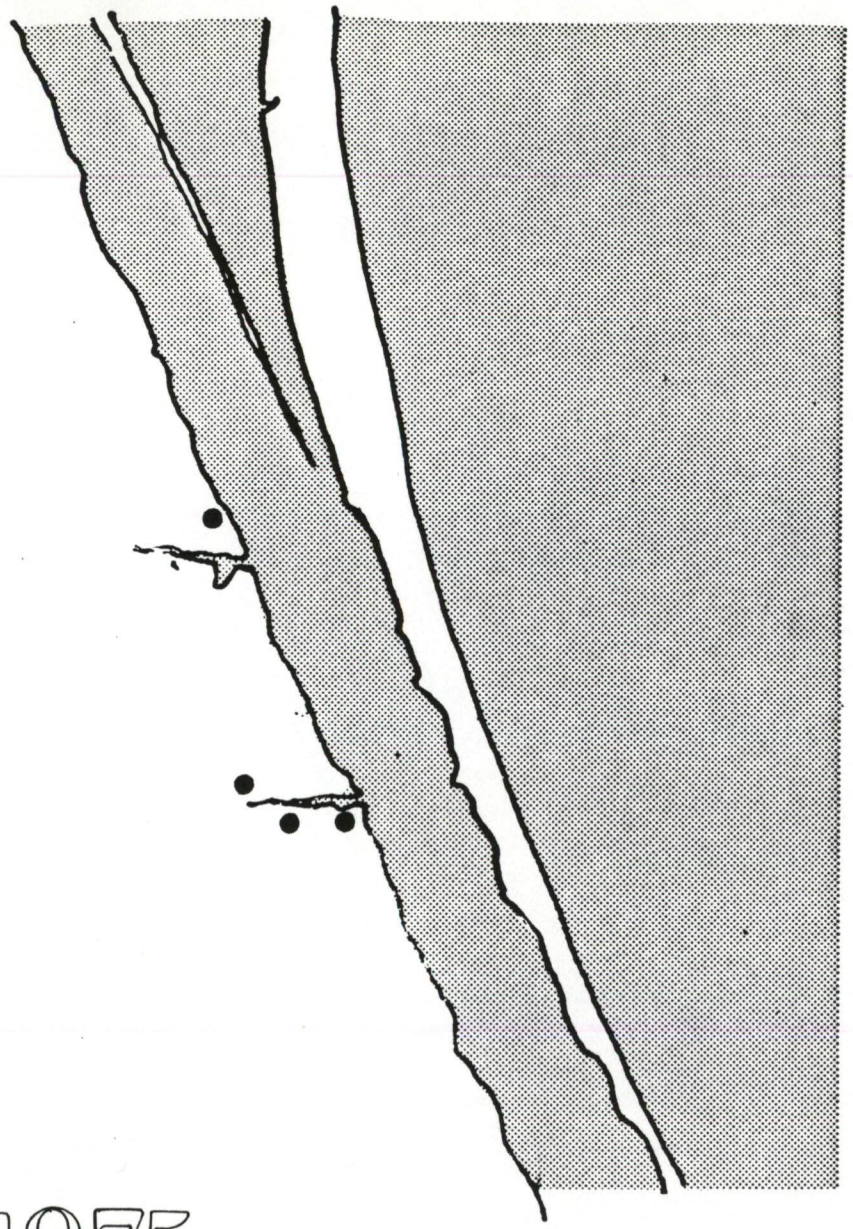
In the early 1900s the growth in the areas was steady as the Kentucky Military Institute created its winter home in Eau Gallie. In the early 1920s people began to move from the northern United States to Florida to live. This bust had a tremendous impact on the towns as they began to build homes and businesses as fast as they could get the materials. By the mid 1920s a bridge in Melbourne and one in Eau Gallie were built accross the Indian River to the barrier island allowing people access.

In 1926 the human tide moved back to the north because of the Miami hurricane. The trains and roads in Florida were loaded to capacity. By 1927 the exodus was over and the state of Florida, including the South Brevard county area, was left empty.

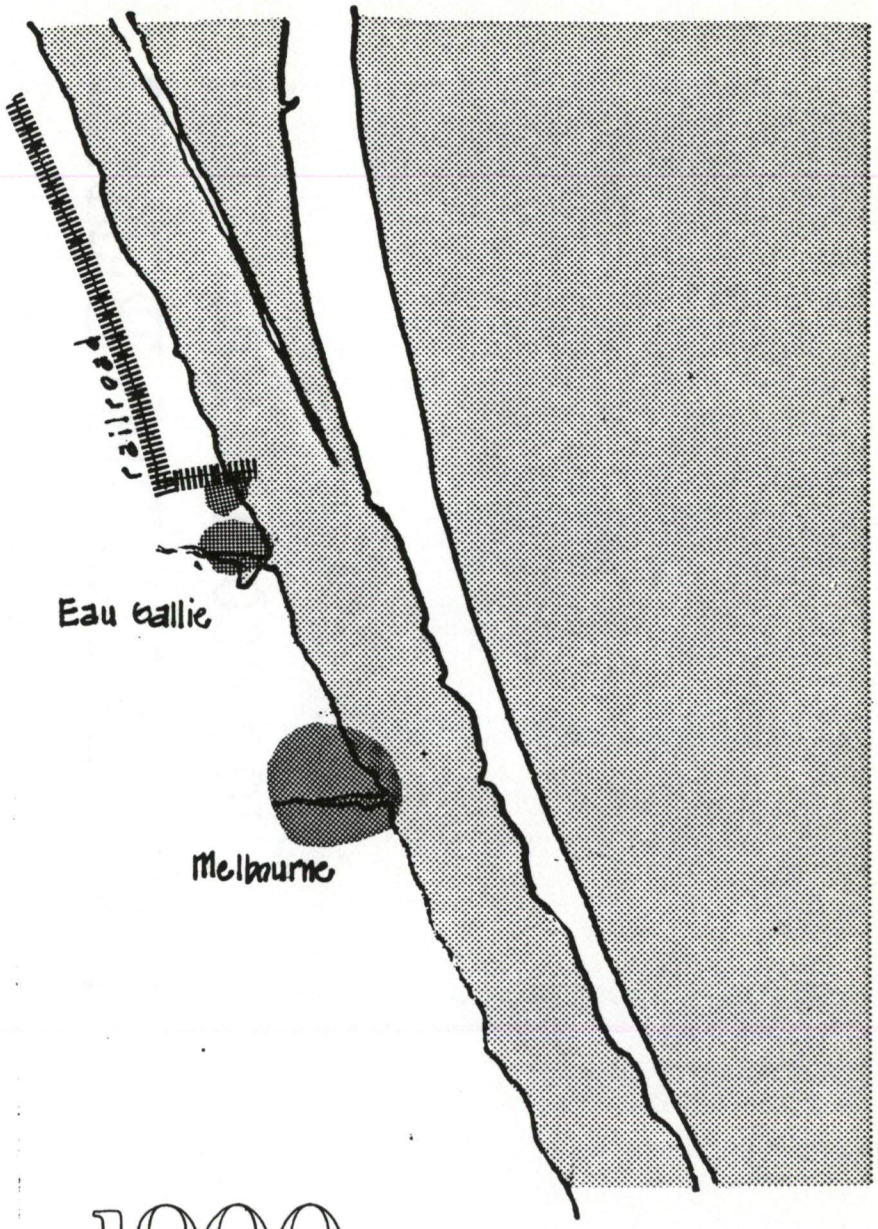
During the war years of War World II a program of mosquito eradication was begun that was very successful. The continuation of this program after the war allowed people to live in Brevard county year-round for the first time without dangerous insect problems.

The creation in 1948 of Patrick Air Force Base in south Brevard County and later the creation of the National Air and Space Administration in northern Brevard County spured a growth that continued as the space program and the race to the moon continued. When the Space program slowed down in the mid 1970s many people were left unemployed. However, the industry in the area took advantage of the high technology oriented people in the area and diversified into other technology related fields, such as computer chips.

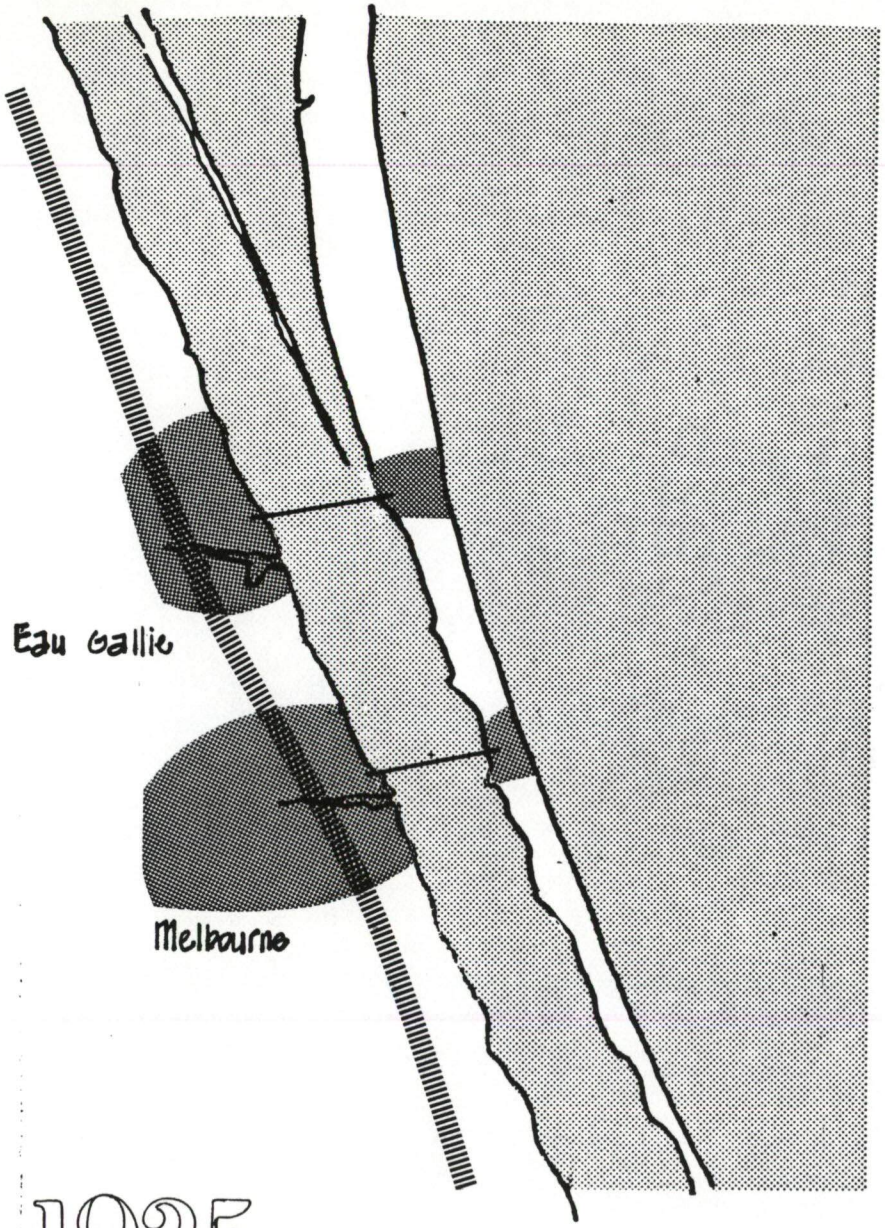
In 1969 the two cities of Melbourne and Eau Gallie merged to form one city that is today known as Melbourne. The new city kept the nickname that was associated with Eau Gallie, "the harbour city." The merger has had rewards and pains. The merger has created more efficiency in government and a more unified, stronger city. There still exists, however, much duplication of programs and facilities. There also exist many people in Eau Gallie who resent having lost their city's name and identity. In the uniting of the two cities the community that was Eau Gallie has been abandoned and ignored as a valuable part of the city of Melbourne. The unity of the former two cities does not require that the community of Eau Gallie must loose its sense of identity and worth. It must instead find its own new ways of being a part of the "new" city.



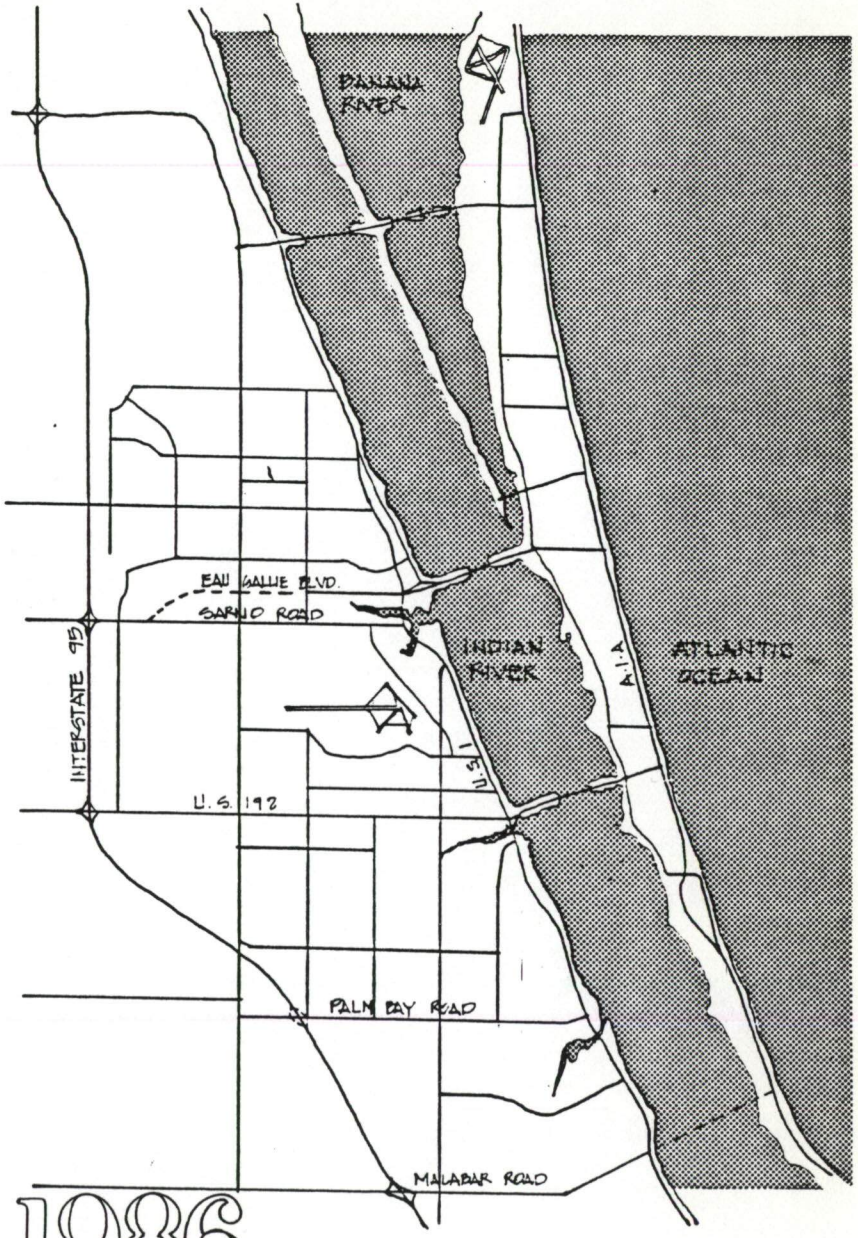
1875



1900


Eau Gallie
Melbourne

1925


BANANA RIVER
EAU GALLIE BLVD
SARNO ROAD
INTERSTATE 95
INDIAN RIVER
A1A
ATLANTIC OCEAN
U.S. 1
U.S. 192
PALM BAY ROAD
MALABAR ROAD

1986

Between 1970 and 1980 the Melbourne metropolitan area witnessed a 33 percent increase in population. Between 1980 and 1990 the area is expected to experience an increase of 41% which represents an increase of approximately 50,000 people, on a base population in 1980 of 130,000 people this is very significant. Present figures indicate that the 1985 population to be about 170,000. (4) At the same time, the county population is expected to grow from 328,000 in 1985 to 498,000 by the year 2010, a 52 percent increase.

POPULATION PROJECTIONS (5)	
1985	170,000
1990	196,600
2000	231,000

The median age for the Melbourne area is 34.3 with an average household size of 2.65. The Indian River, however marks a distinct change in the median age and the distribution of people by race. The median age for the west side of the river is about 32, of which about 90% are white, 10% black and 1.5% are other races. On the east side of the river the median age is about 40 with about 98.5% white, 0.5% black and 1.0% of other races. (6)

Cenus data indicates that the area population is predominately middle-aged and well educated. County data also indicates that the area's average annual pay of $17,201 is the second highest in Florida. In fact, The U.S. Department of Commerce ranks the Melbourne area sixth in business and income growth. (7)

OCCUPATION (8)	% of Adult Population
Services	25.5
Trade	22.3

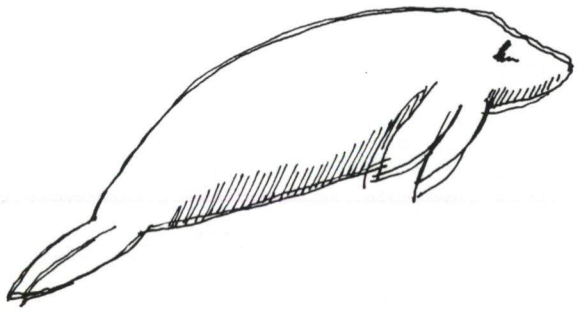
Manufacturing	21.7
Government	16.5
Construction	5.8
Transportation/Utilities	4.1
Finance/Insurance/Real Estate	3.6

CULTURAL

Although Melbourne has long been known as a recreational playground, it was until several years ago known as a "cultural desert." That image is changing. Many of the residents are working with the industry in the area in an attempt to improve the quality of life in Melbourne. The Space Coast Science Center is an example of a project that has grown out of that new interest and emphasis on cultural activities.

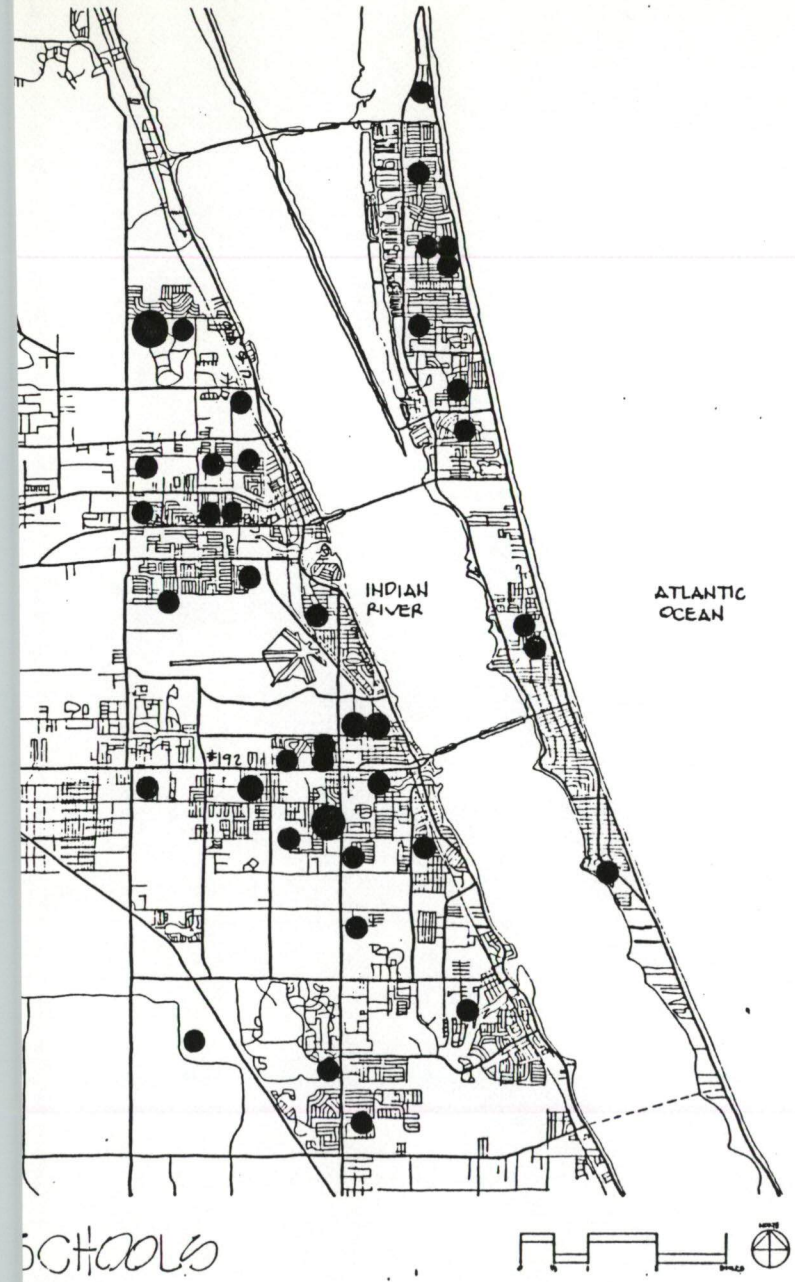
CULTURAL OPPORTUNITIES IN THE MELBOURNE AREA

Brevard Art Center and Museum
South Brevard Historical Museum
Brevard Community College Melbourne Campus Art Gallery
The Brevard Arts Council
The Brevard Symphony Orchestra
The Civic Music Association
The Brevard Regional Arts Group, Inc.
The Melbourne Chamber Music Society
The East Coast Dance Theatre
Indian River Players
The Melbourne Municipal Band
Brevard Zoological Park



SCIENCE RELATED OPPORTUNITIES ON THE SPACE COAST

Cape Canaveral Wildlife Refuge *
Erna Nixon Hammock *
Pelican Island



mall dots indicate the location of schools, and
rge dots indicate the location of colleges & universities.

THE CITY

Planetarium at Brevard Community College
Sebastian Inlet Park
Solar Center at Cape Canaveral
Space Museum at Kennedy Space Center
Turkey Creek *
Housers Zoo
Observatory at local school

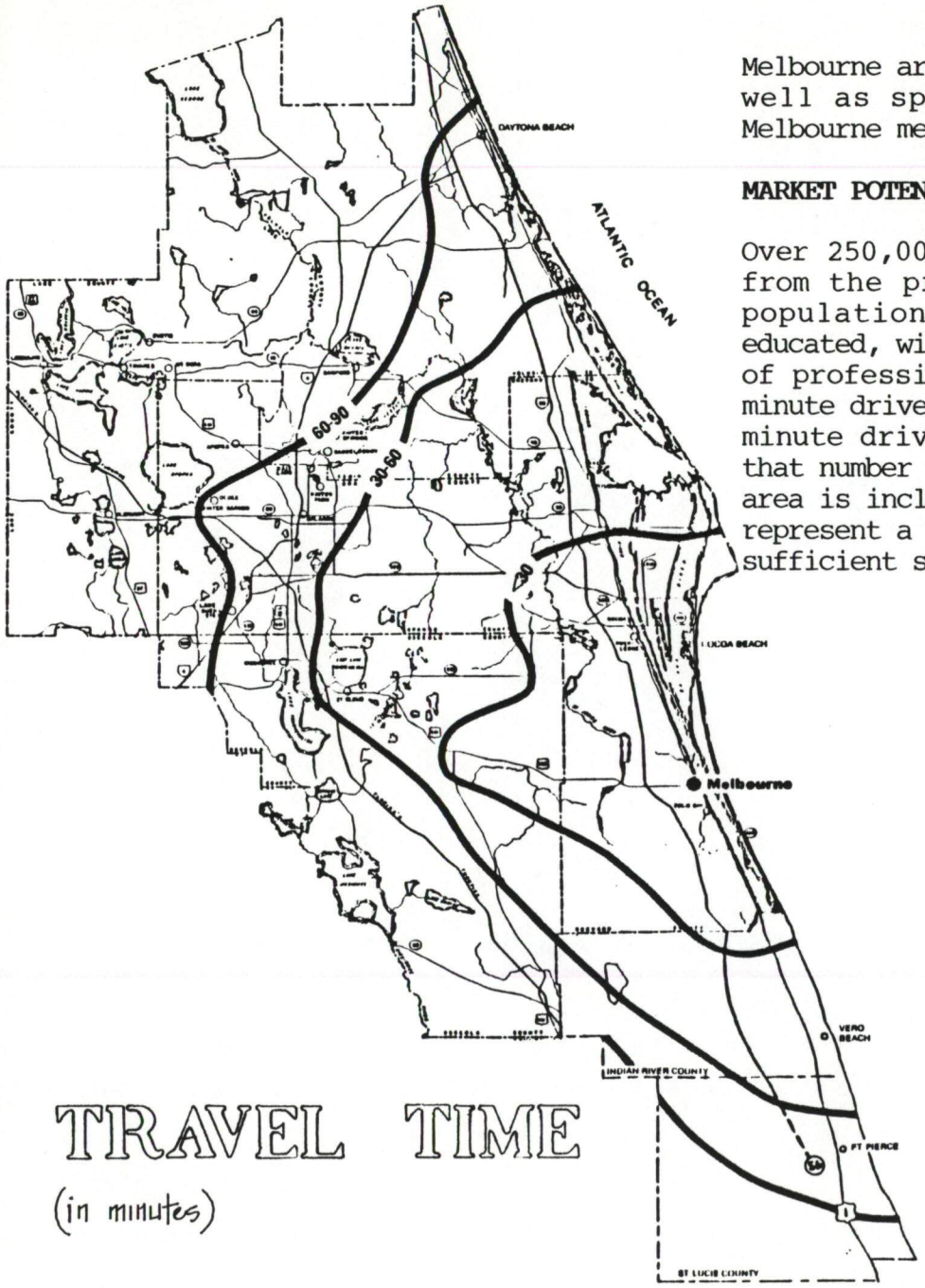
* indicates possible field stations

EDUCATION.

There are sixty-eight primary and secondary schools in two districts on the Space Coast with an enrollment of about 57,000 students, making it the 64th largest school district in the nation. Of these sixty-eight schools on the Space Coast, almost forty are in the Melbourne metropolitan area. These schools are recognized as state and national leaders in academic excellence. The schools in this area produced more winners at the 1983 International Science Fair than any other school district in the world. Seven of the Space Coast's nine participants were award winners.(9) The Space Coast also ranks first in the state of Florida in the percentage of high school graduates going to college. (10)

The colleges in the Melbourne area include the Florida Institute of Technology and the Brevard Community College. The Florida Institute of Technology has an enrollment of about 4,500. The university has gained an international reputation for academic excellence in the areas of science, engineering, and the related disciplines of management and communication. Ninety percent of the full-time faculty members hold Ph.D. degrees. (11)

The Brevard Community College, a two year school with three campuses serving 40,000 people, one of which is in the

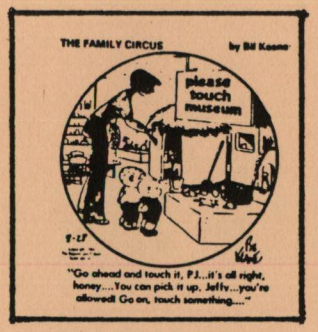


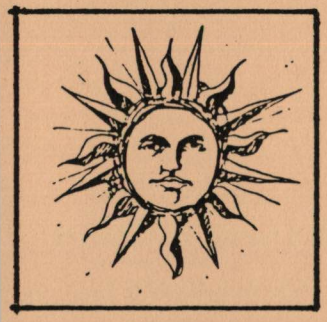
THE CITY

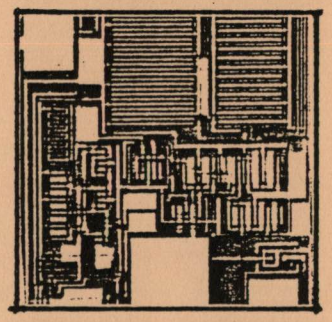
Melbourne area. The school offers associate degree programs as well as sponsoring five adult education centers in the Melbourne metropolitan area.

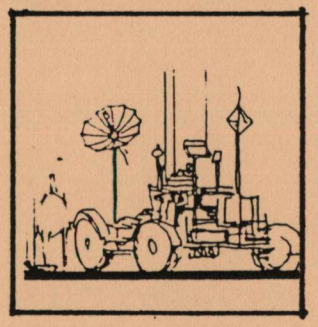
MARKET POTENTIAL

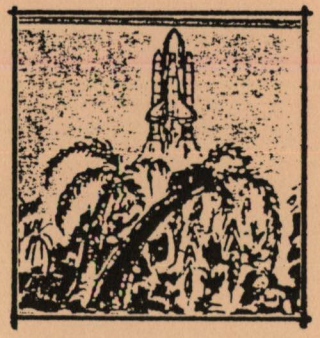
Over 250,000 people currently live within a thiry minute drive from the proposed site. The general character of this population is that it is predominately middle-aged, well educated, with a relatively high income, and a high proportion of professionals. By 1990 the number of people within a thirty minute drive should increase to over 300,000. Within a sixty minute drive of the site there are nearly 500,000 people and that number should increase to 600,000 by 1990. If the Orlando area is included that number nearly doubles. (12) These numbers represent a respectable number of people that should provide sufficient support for the Space Coast Science Center.



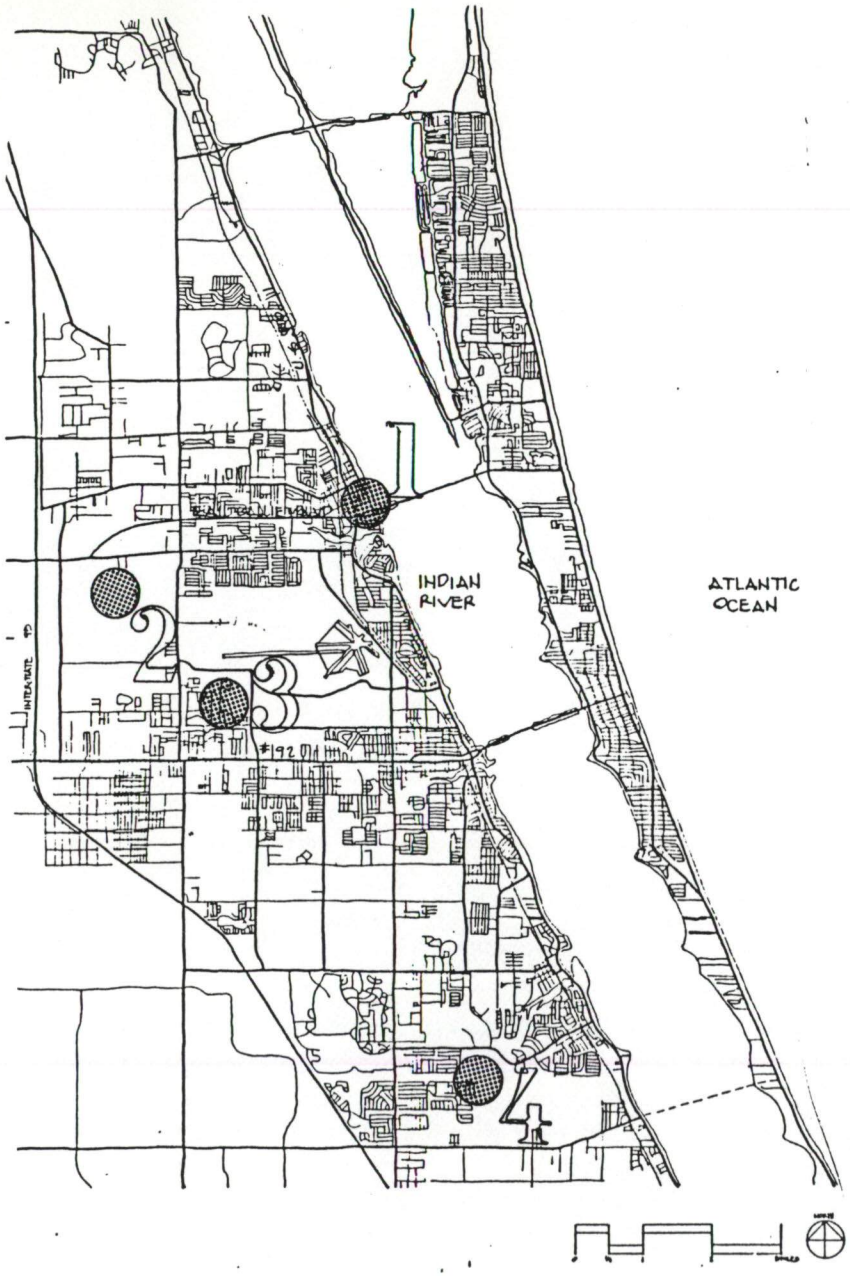








SITE SELECTION



CRITERIA. **SITE SELECTION**

ACCESS. The site must be easily accessible to the people of South Brevard county. Preferably, it would be centrally located and near major transportation routes.

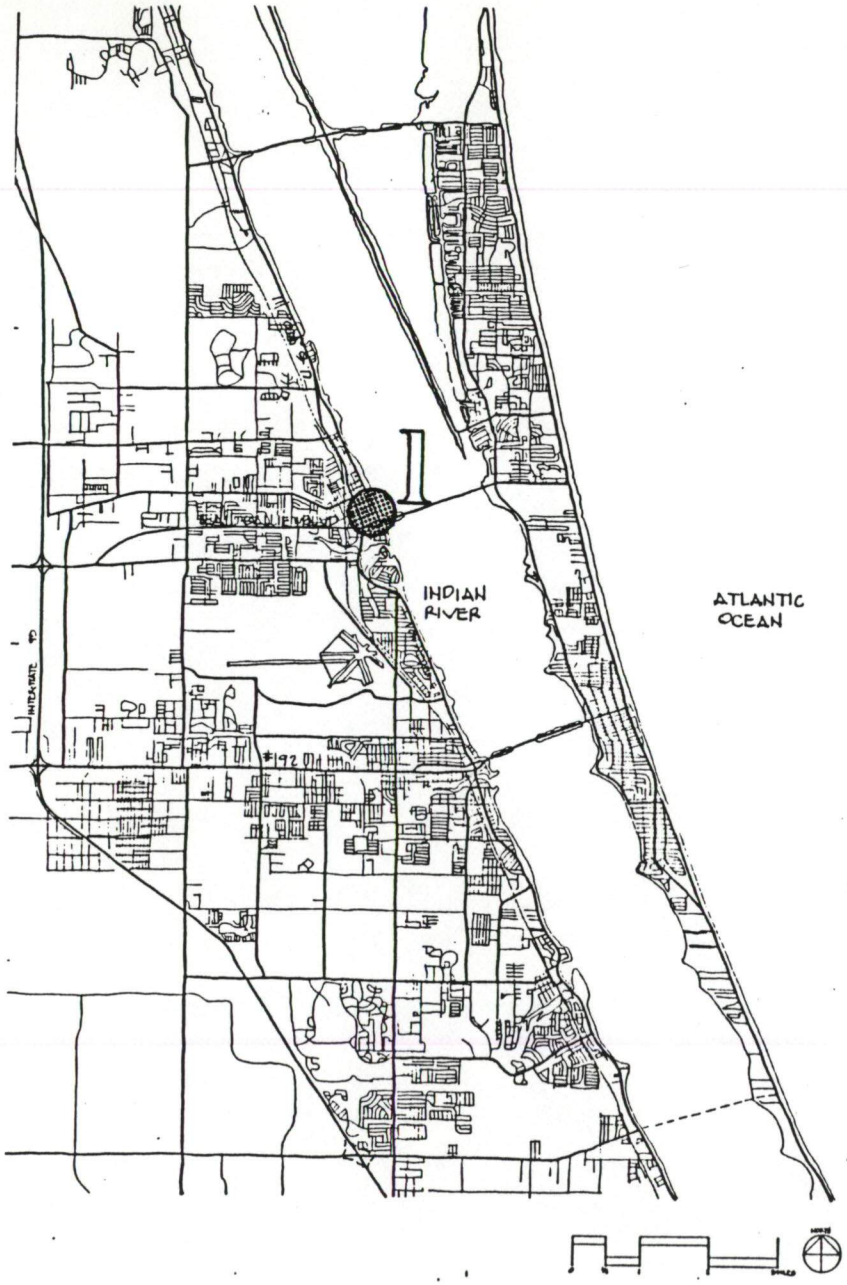
EXPANSION. The site must have room for the science center to expand.

PROXIMITY TO OTHER CULTURAL ACTIVITIES. Because the science center will tend to attract a similar audience as other cultural facilities it should be located near existing facilities in South Brevard county.

PROXIMITY TO SCHOOLS. Because school children on field trips will be frequent visitors to the science center, the site should be located so that it is readily accessible to the area schools.

ACTIVITY CENTER. The site should be located in an area where it can benefit from as well as contribute to the excitement and activity of a place.

PROPER FIT. The science center should have a sense of being a proper fit in the community that it is located. Activities around the science center should be compatible with those of the center.



SITE ONE - EAU GALLIE AREA **SITE SELECTION**

ACCESS. Located at one of the few causeways connecting the barrier island to the mainland, there is good vehicular access and exposure.

EXPANSION. Depending on its location within the setting, there could be adequate room for expansion.

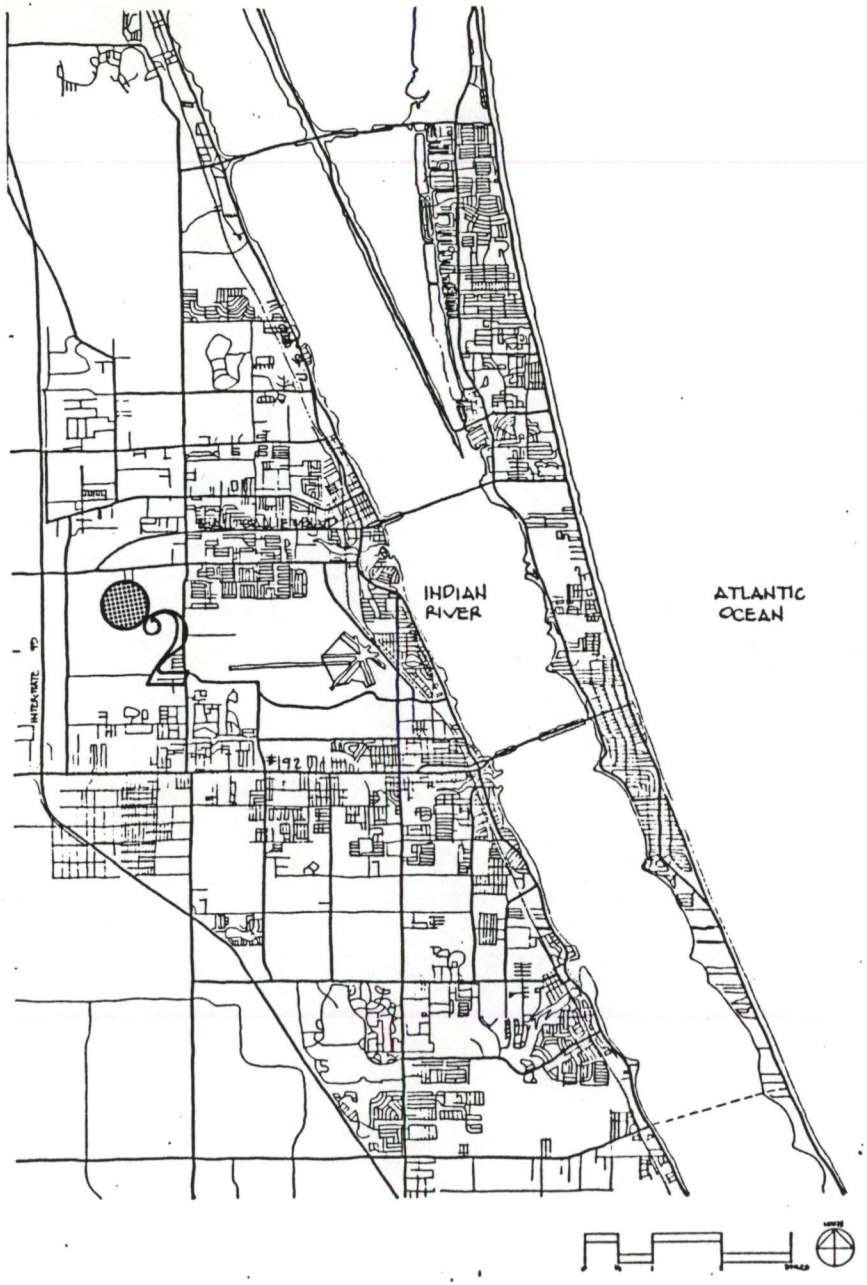
PROXIMITY TO OTHER CULTURAL FACILITIES. The Brevard Art Center and Museum, a branch of the public library system, as well as other cultural facilities and galleries already exist in the area.

PROXIMITY TO SCHOOLS. The site is in a central location with respect to the area schools.

ACTIVITY CENTER. Located on the Indian River in an old area of South Brevard county Eau Gallie offers much potential as a cultural focus for the area.

PROPER FIT. Given the present use and activity of the area, the addition of a science center would be compatible with this setting.

SITE TWO - SARNO ROAD.



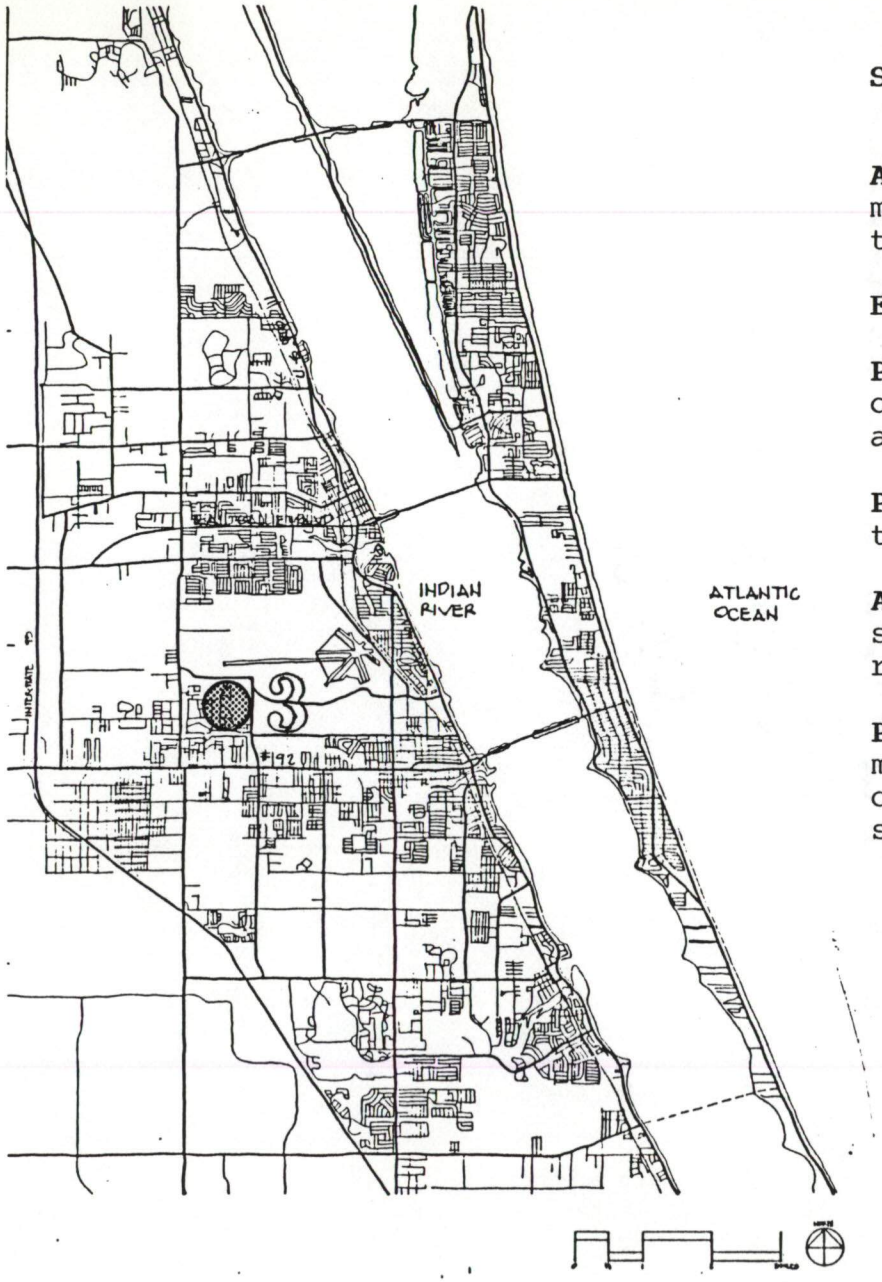
ACCESS. Located on one of the major east-west roads the site is easily accessible although it is outside of the developed area of Melbourne as it exists today, and, therefore would not receive as much visibility. In the future, however, the area around this site will be developed as either a large recreation park or a location for a multi-purpose facility and colliseum.

EXPANSION. Because the site is in an undeveloped area there is significant room for expansion.

PROXIMITY TO OTHER CULTURAL FACILITIES. There are no other cultural facilities presently in the area, but there is a possiblity that a multi-purpose / colliseum facility will be built there in the future.

PROXIMITY TO SCHOOLS. The site is basically centrally located to the area schools.

ACTIVITY CENTER AND PROPER FIT. There exists no present activity, other than the present use of the site as a landfill, but there is the proposed activity of a multi-purpose facility.



SITE THREE - ERNA NIXON HAMMOCK **SITE SELECTION**

ACCESS. Access to the site is somewhat remote from the main movement patterns of Melbourne. This limits the exposure of the science center.

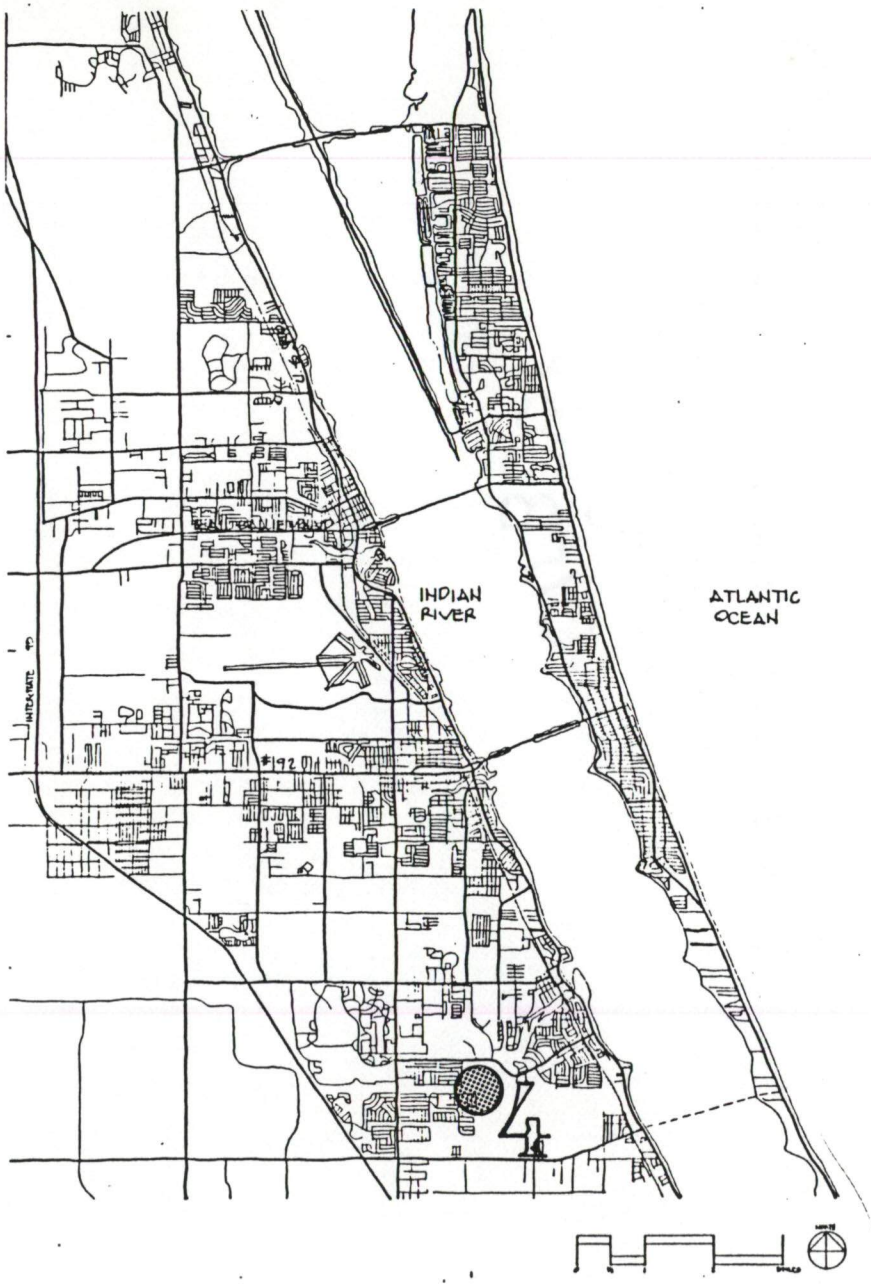
EXPANSION. There is plenty of room for expansion.

PROXIMITY TO OTHER CULTURAL FACILITIES. There are not any other cultural facilties in the area. However, the site is located in an environmental area that attracts visitors.

PROXIMITY TO SCHOOLS. The site is located in good proximity of the area schools.

ACTIVITY CENTER. There exists little activity in the area similar to that generated from a science center. A major regional shopping mall is located in the vicinity, however.

PROPER FIT. The site is an environmental area that would have much to offer in the area of nature walks, however, one must be concerned about the impact of the traffic and activity of a science center on a sensitive area.



SITE FOUR - TURKEY CREEK

SITE SELECTION

ACCESS. Access to the site is somewhat "roundabout." This hurts the possibility of attracting tourists as well as limiting exposure to the residents of South Brevard county.

EXPANSION. There is adequate room for expansion.

PROXIMITY TO OTHER CULTURAL FACILITIES. Although there is a library in the area, that is the only cultural activity presently existing in the setting of this site.

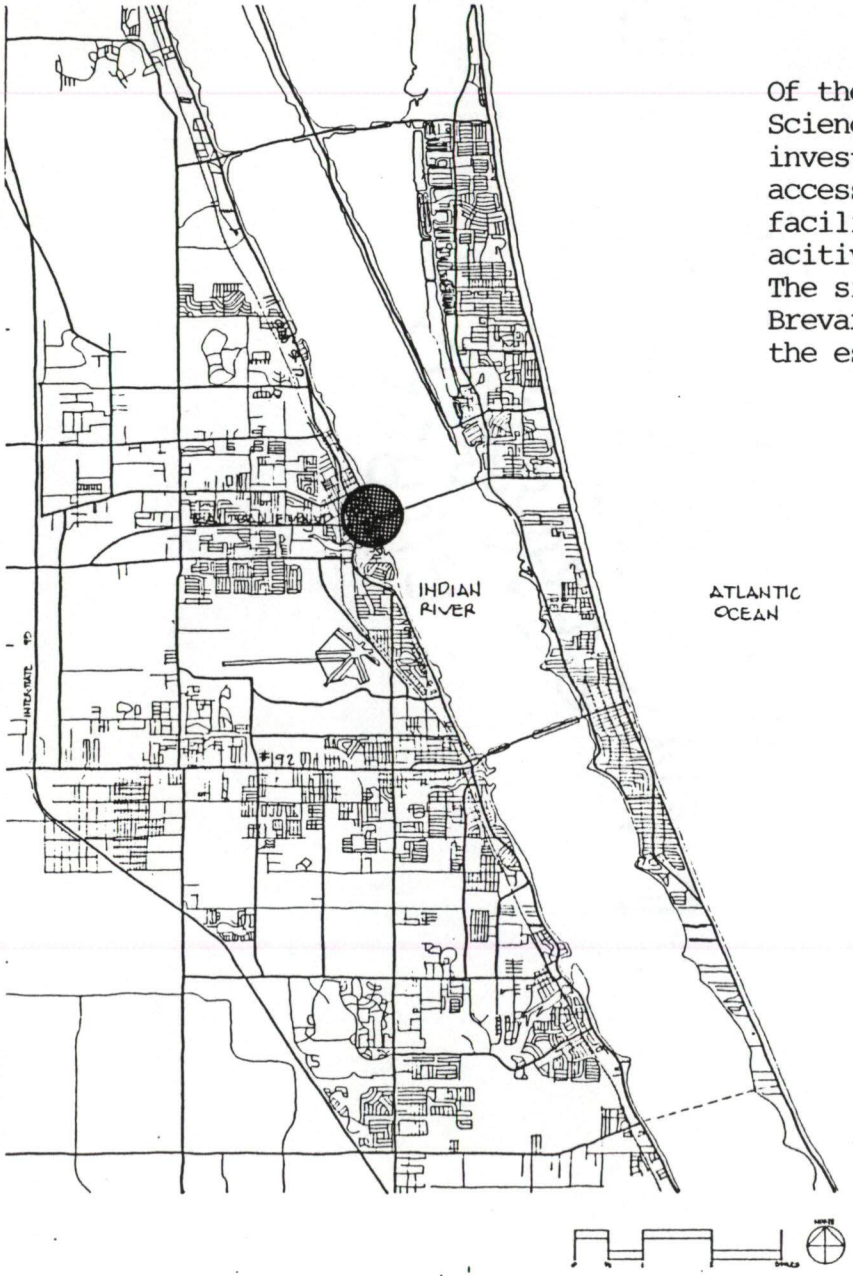
PRROXIMITY TO SCHOOLS. Because the site is located south of Melbourne, it is not central to the location of the schools.

ACTIVITY CENTER. There presently does not exist the activity that would be compatible with that of a science center.

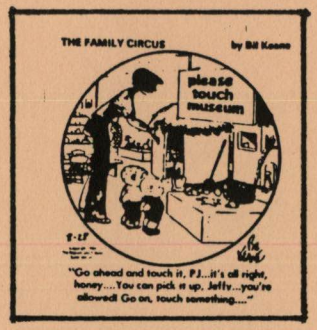
PROPER FIT. The question of proper fit is again one that is concerned with the compatibility of a science center and a environmentally sensitive area.

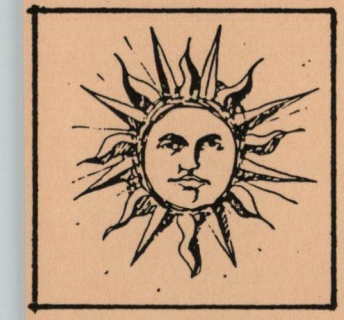
CONCLUSION

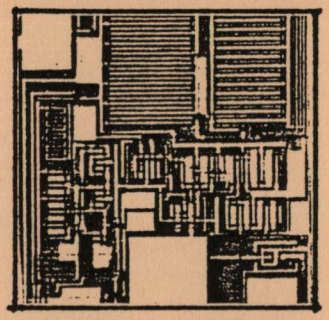
SITE SELECTION

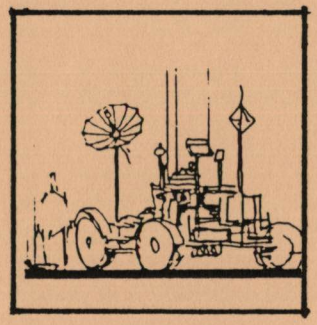


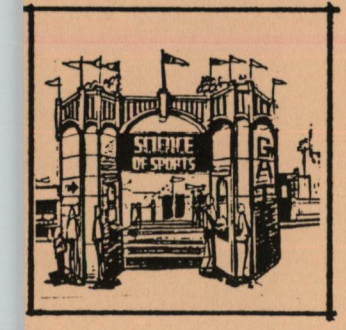
Of the sites considered for the location of the Space Coast Science Center, the Eau Gallie area site was chosen for further investigation. This site best satisfies the criteria of accessibility, expansion potential, proximity to other cultural facilities, proximity to the area schools, image as an acitivity center, and proper fit with the context of the area. The site offers much potential to rehabilitate an area of South Brevard county that has much promise, and to reinforce one of the established centers of Melbourne.

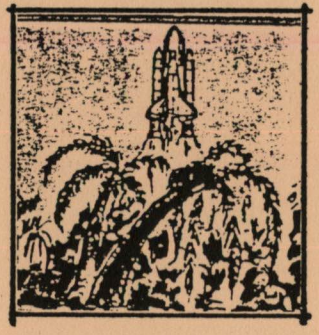




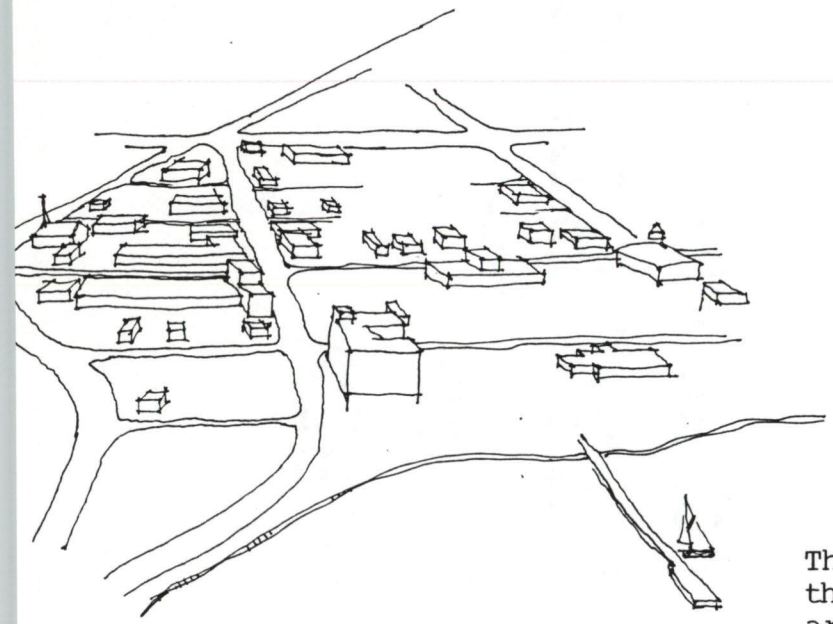








THE SETTING :
EAU GALLIE DISTRICT



"Like crabs, humans like to live near the water.

Since urban civilization began 5000 years ago, between the Tigris and Euphrates rivers in Mesopotania, most cities were built along rivers, lakes, or the sea. In new cities, like Canberra, Brasilia, Reston, and Columbia, where nature forgot, the planners created artificial lakes.

Bodies of water provide not only transportation and food, they can also give us infinite pleasures. They add excitement as well as serenity, definition as well as a sense of space to the cityscape, to say nothing of cool breezes, recreation, and reflections at night." (13)

The Indian River as it passes through Melbourne has retained through the years a very pleasant residential character. There are few points of contact, however, between the people of Melbourne and the river. The Eau Gallie district has the unique opportunity to provide such a place of contact with the river. The Eau Gallie riverfront can provide a place for waterside activities, such as concerts and art shows, as well as provide a place for the passive enjoyment of the river. It can provide for Melbourne the opportunity of enjoyment of the river while in persuit of other interests, such as shopping or attending a cultural facility.

EAU GALLIE AS A CULTURAL CENTER

There exist the opportunity in Eau Gallie for the Brevard Art Center and Museum and the Space Coast Science Center, as the two major cultural institutions in Eau Gallie, to transform the area into the cultural focus for the South Brevard County region. The two together have the opportunity to create a center of cultural and community activity that take advantage

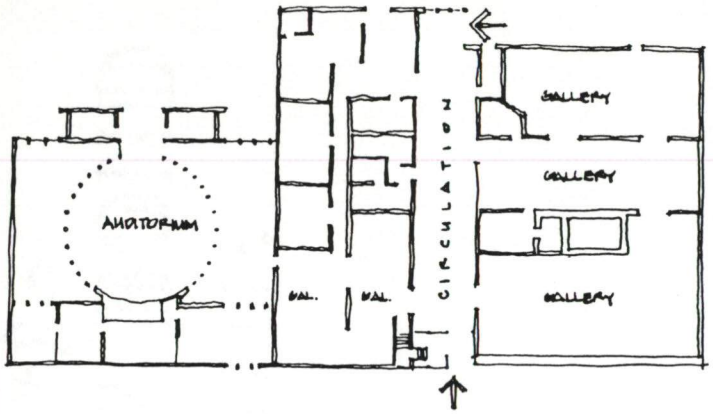
GINTER BUILDING

of their joint visitor drawing power. The area should be a center of art and music festivals along the river. The area should take full advantage of its present cultural residents, the symphony orchestra and art galleries, as well as encourage more such activities to locate in the Eau Gallie area.

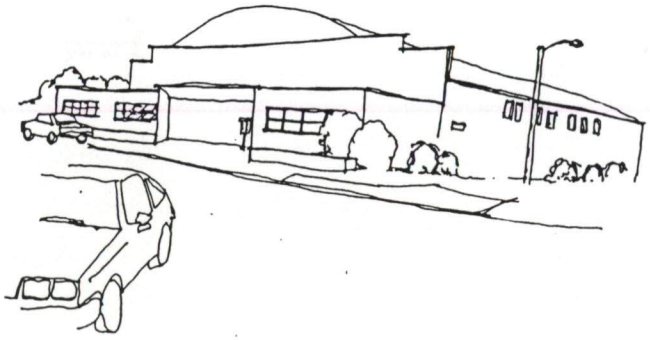
It is central to this concept that the art and science centers not exist as cultural islands in the community. They must venture beyond their respective sites to create a community that can serve the region by providing a cultural focus along the riverbanks.

The Spanish style hotel that exists in the area was built in 1925 with 70 guest rooms. Although it possesses much charm and character, the structure presently sits empty. There is a developing firm that is interested in renovating the facility into a luxury hotel to accommodate Melbourne's corporate visitors. They are proposing the renovation of the hotel to have 56 guest rooms and a lounge. Other groups have previously studied the adaptive reuse of the building as a leaseable office space or condominiums. The presence of the hotel structure is very important to the character and image of Eau Gallie and, therefore, to this project. It is, therefore, for the purpose of this study assumed that the structure will continue restoration as a hotel.

At present Eau Gallie Boulevard is visually, functionally, and hazardously too close to the hotel structure. Therefore, the relocation of this road will be studied as part of this project. In other planning efforts concerning the hotel, a drop off for its guests will be provided as well as providing parking for its guests in the proposed parking structure.



PLAN



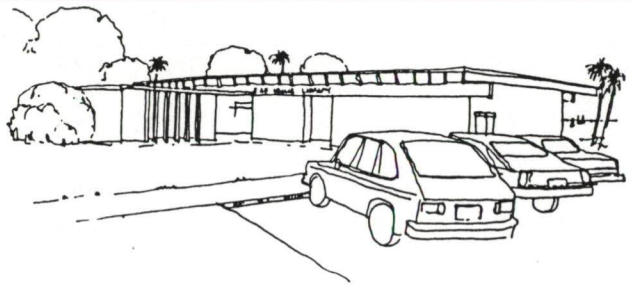
BREVARD ART CENTER AND MUSEUM BUILDING

SETTING

Originally built as a bank building, the structure later served as a city hall and fire station, then a police station, before being purchased by Brevard Art Center and Museum in 1985. It has recently been renovated to accommodate the needs of the art center and museum. The renovated facility should accommodate the needs of the art center for the immediate future with an addition or completely new structure necessary in five or ten years to accommodate the long range needs of BACAM. These growth issues should be studied while considering the development of the area and the location of the Space Coast Science Center.

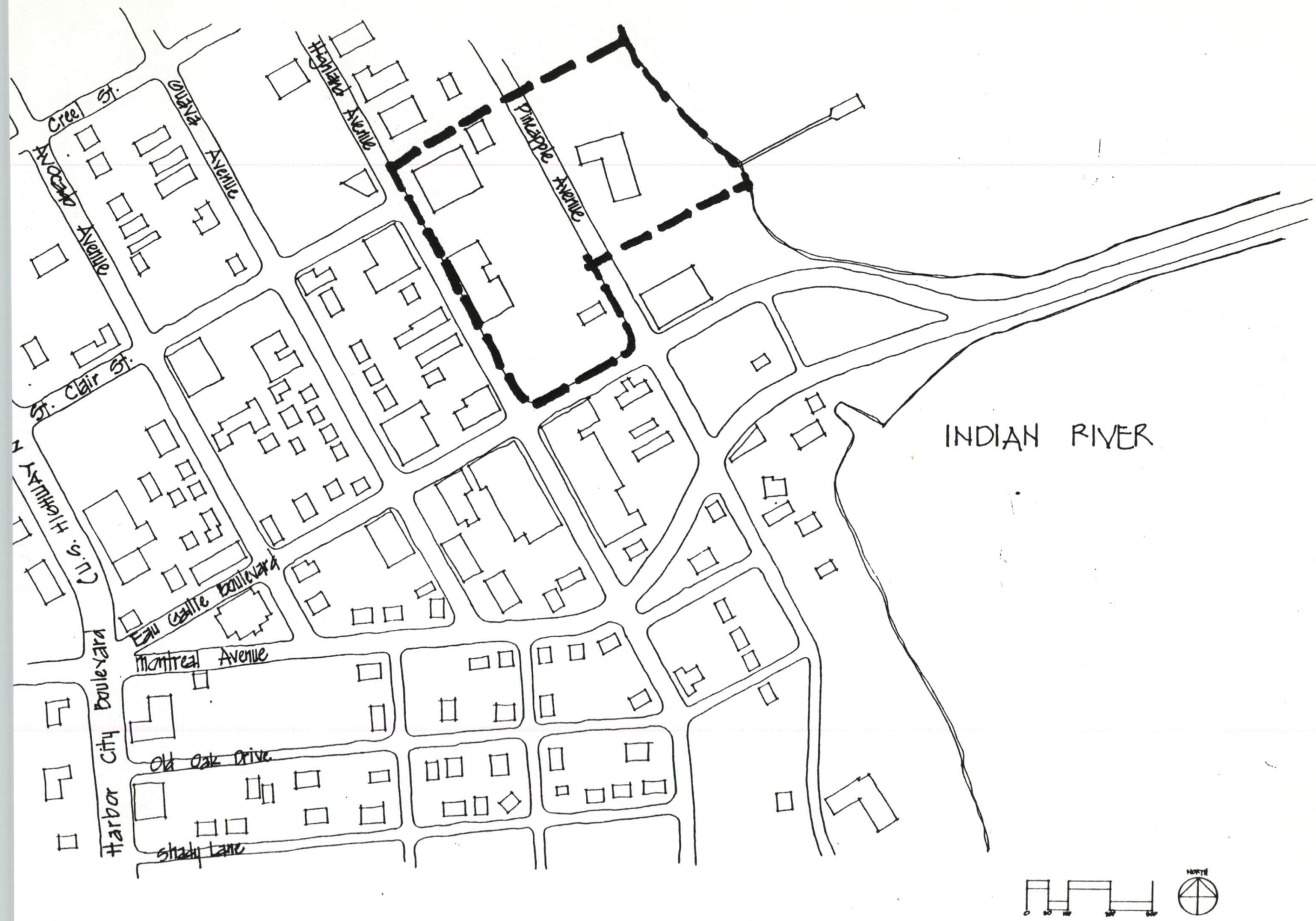
EAU GALLIE CIVIC CENTER

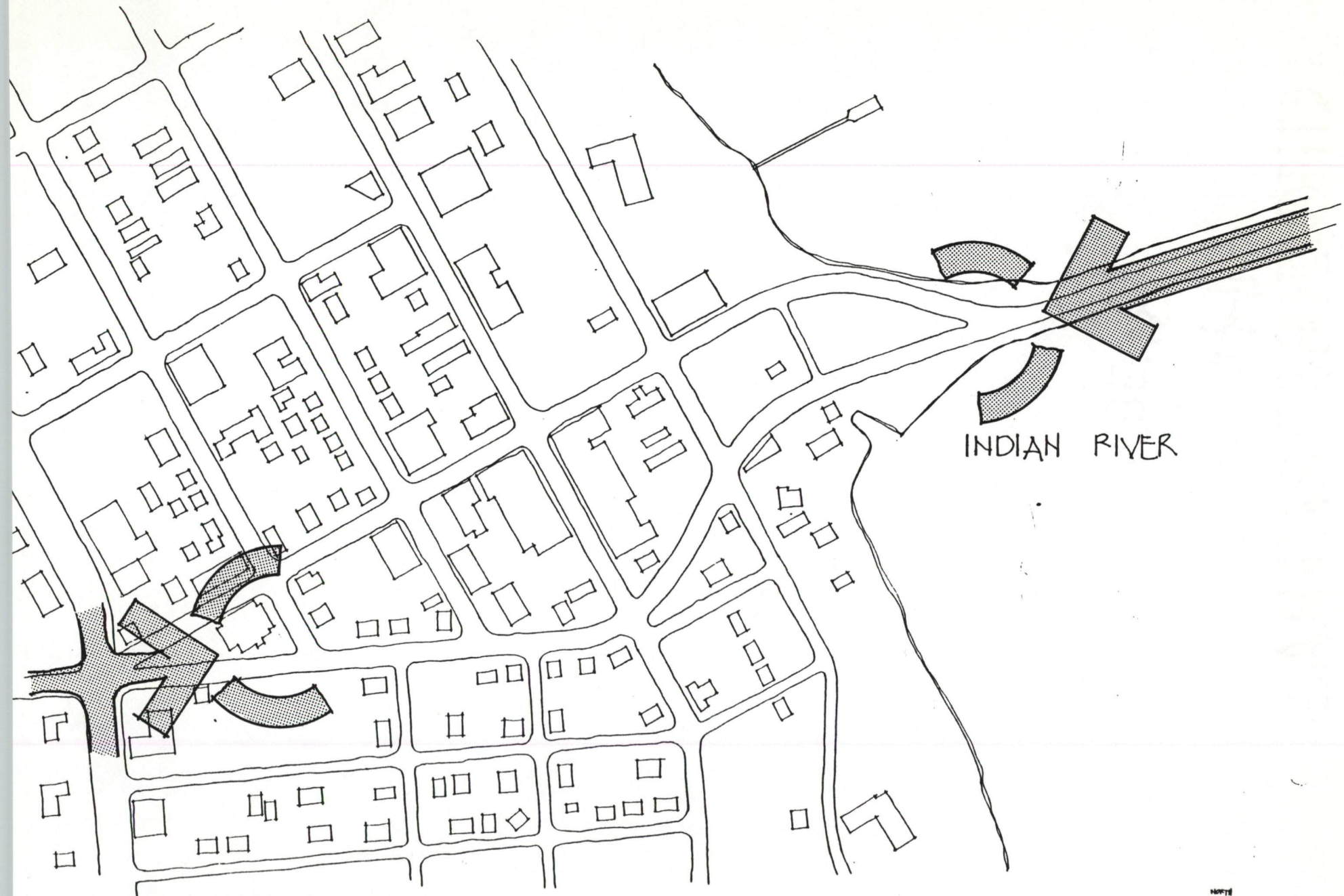
The Eau Gallie Civic Center, with a capacity of 500 persons seated, is an outdated part of the Eau Gallie community. The assembly function that it provides could be better accommodated as part of the SCSC or BACAM or, for the larger audiences, the proposed Multipurpose facility to be located in Melbourne. The present structure serves no major functional or visual use to its context. It is, therefore recommended that it be removed and the activities that it does contain be relocated.

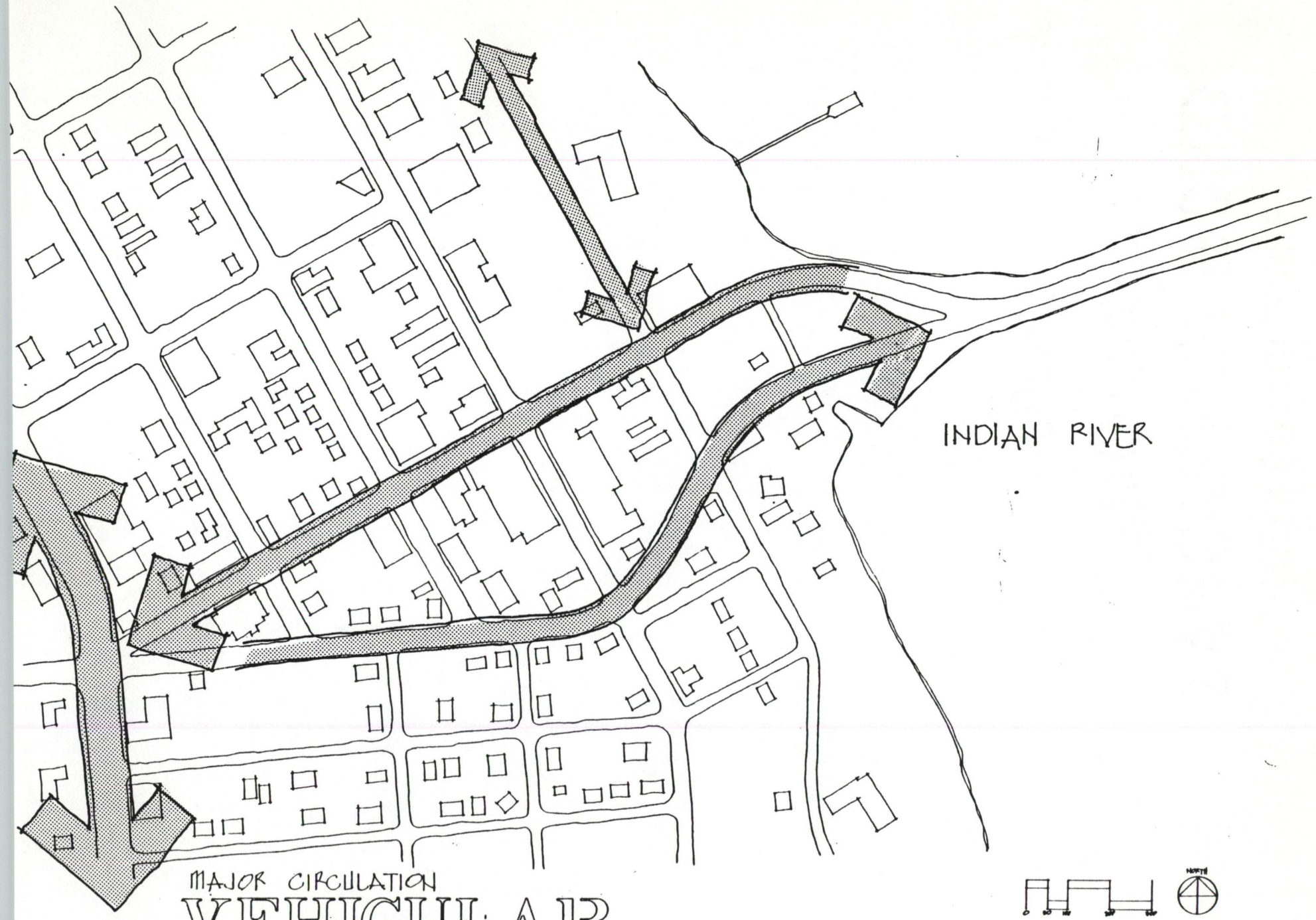


The Eau Gallie Library is a 10,600 square foot branch library of the Brevard County Library System. Due to the strong "relationship between the use of the library and the distance separating the user from it" (14) and due to the difficulty of centralization of the library system caused by the elongated shape of the county, the Brevard Library system relies very much on its branch libraries to serve the needs of the county. In a June 1985 report, A Facilities Plan for the Brevard County Library System, by HBW Associates, Inc. , library planners and consultants of Dallas, Texas, it was suggested that the Eau Gallie Library should be closed and relocated to the Palm Shores area. This report, however, was not based on a vision of the Eau Gallie district as the cultural center for the south Brevard County region. HBW did state that "libraries should be located where people can easily reach them and conduct other activities during the same trip," (15) which reinforces its proper fit within the the Melbourne cultural center. One would, therefore, project that, instead of relocation outside of the Eau Gallie district, the library should plan for expansion to serve its increased audience.

The Eau Gallie Library currently houses the Brevard County library system's collection of fine art books and materials. With the addition of the science center to the area, the library should also contain the library system's major collection of science related books and materials. It would, therefore, strengthen its relationship with the Brevard Art Center and Museum and the Space Coast Science Center.

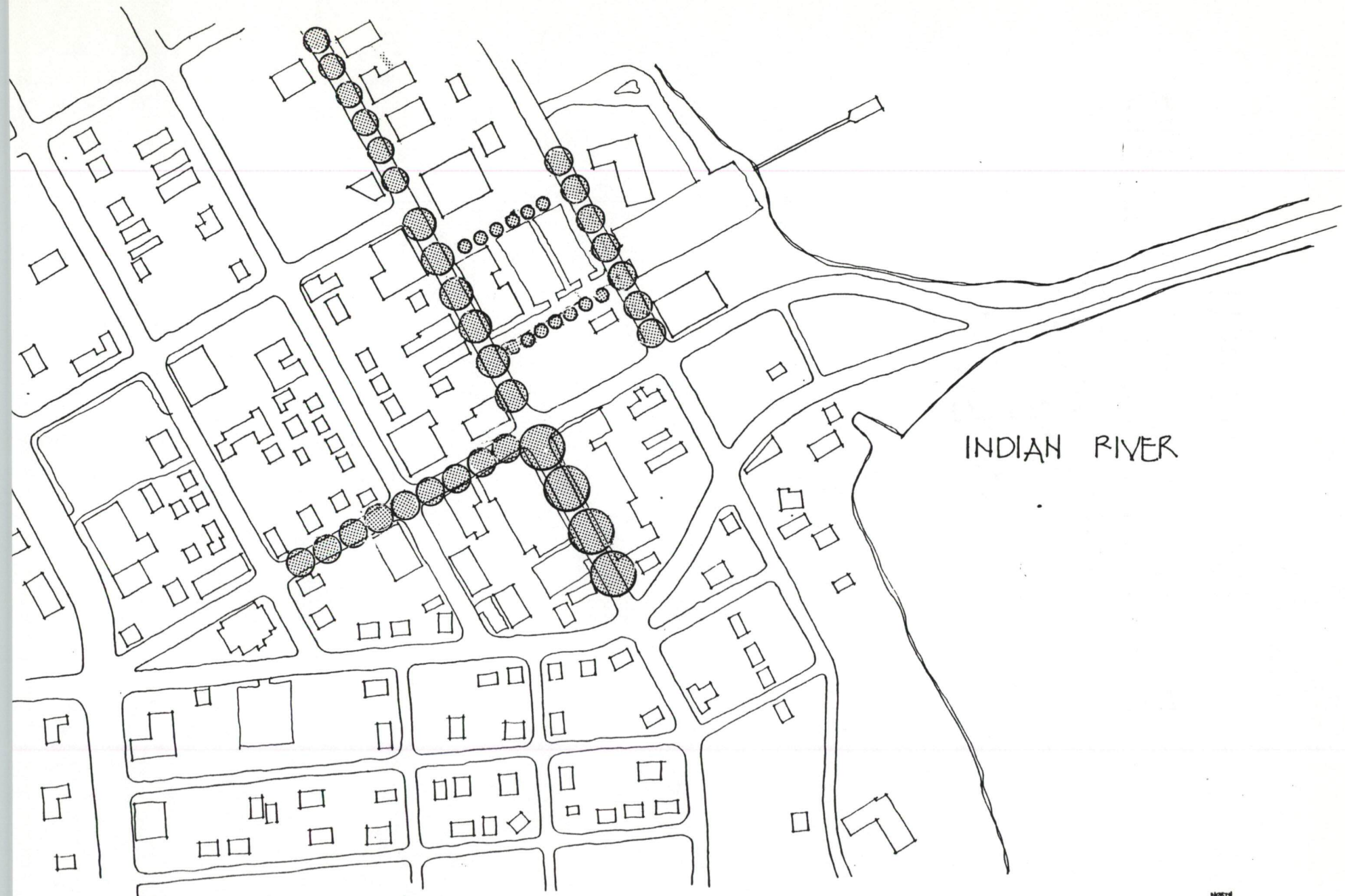

Cree St.
Avocado Avenue
Guava Avenue
Highland Avenue
Pineapple Avenue
St. Clair St.
U.S. 1 Highway
Eau Gallie Boulevard
Montreal Avenue
Harbor City Boulevard
Old Oak Drive
Shady Lane
INDIAN RIVER
NORTH


INDIAN RIVER
GATEWAYS
NORTH



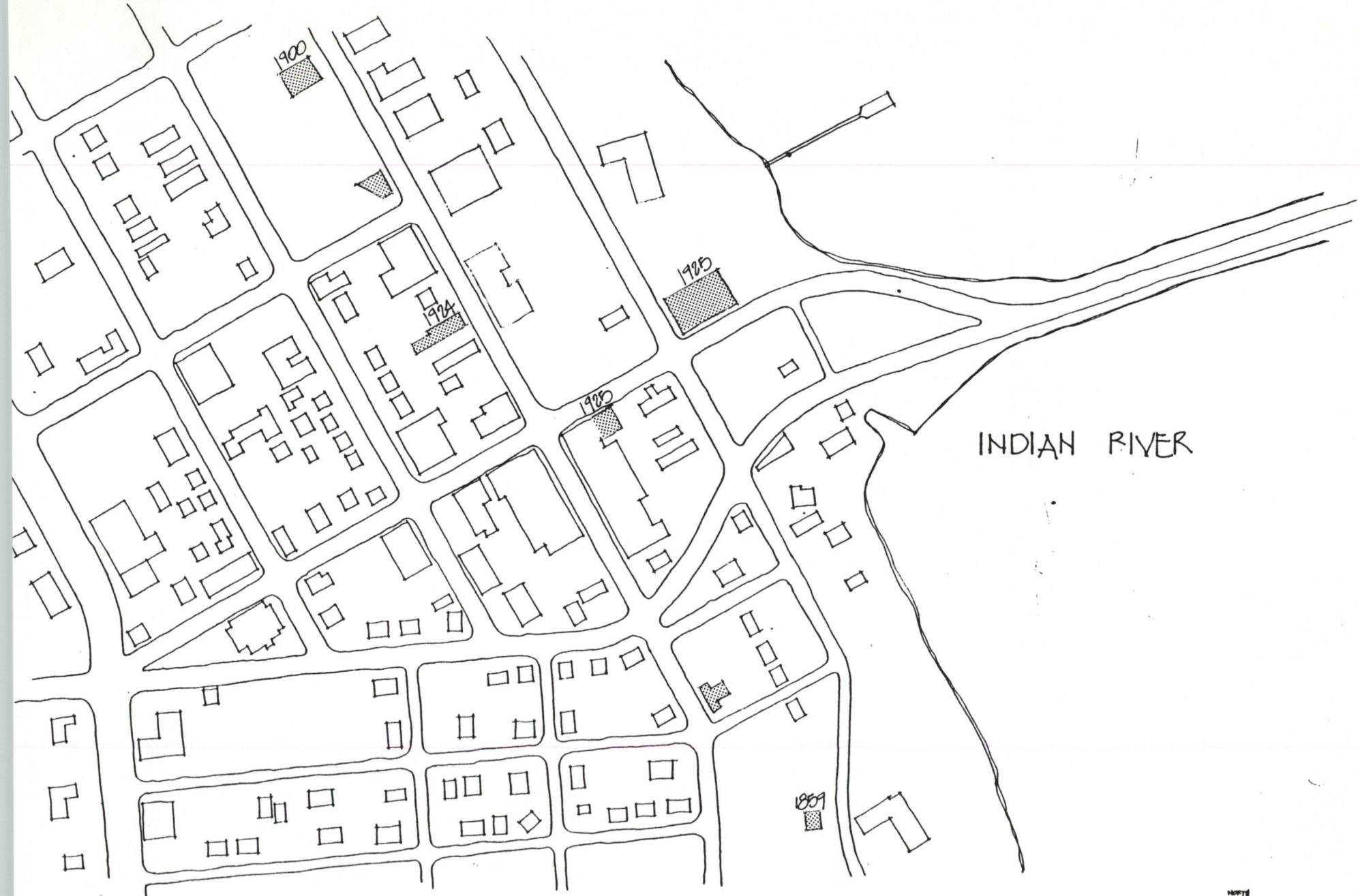
MAJOR CIRCULATION

VEHICULAR



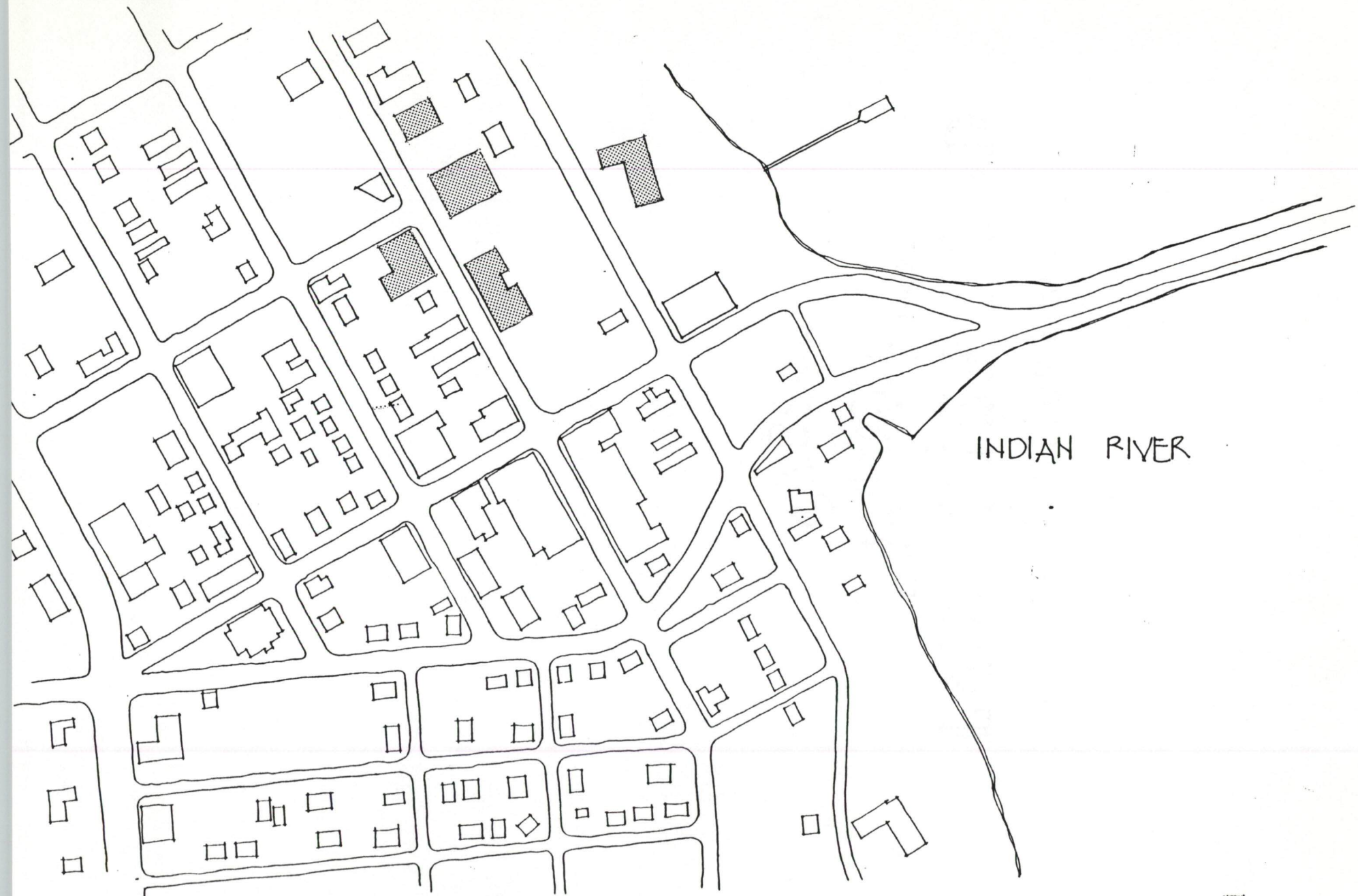
MAJOR CIRCULATION

PEDESTRIAN

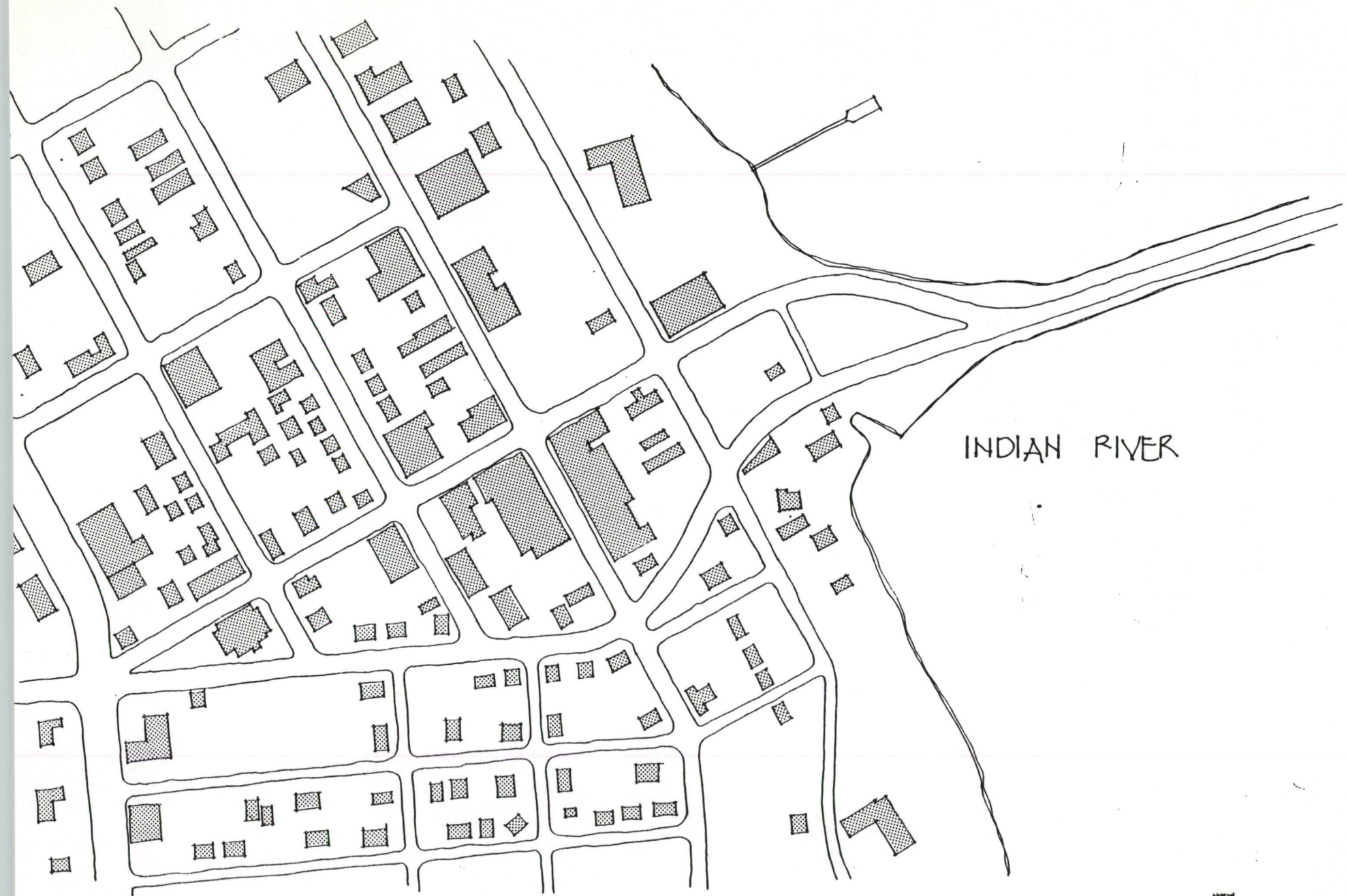


HISTORIC

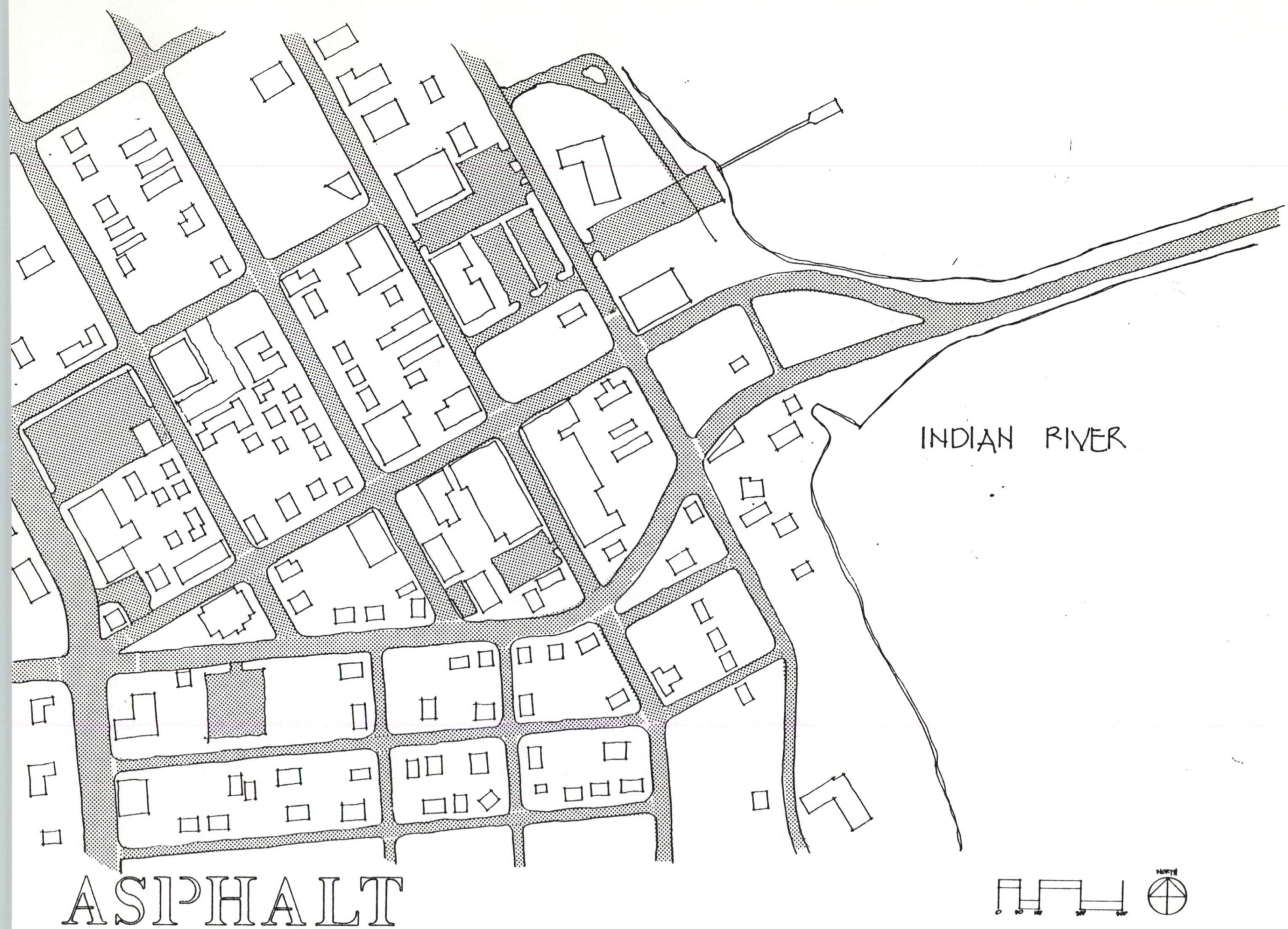
LANDMARKS

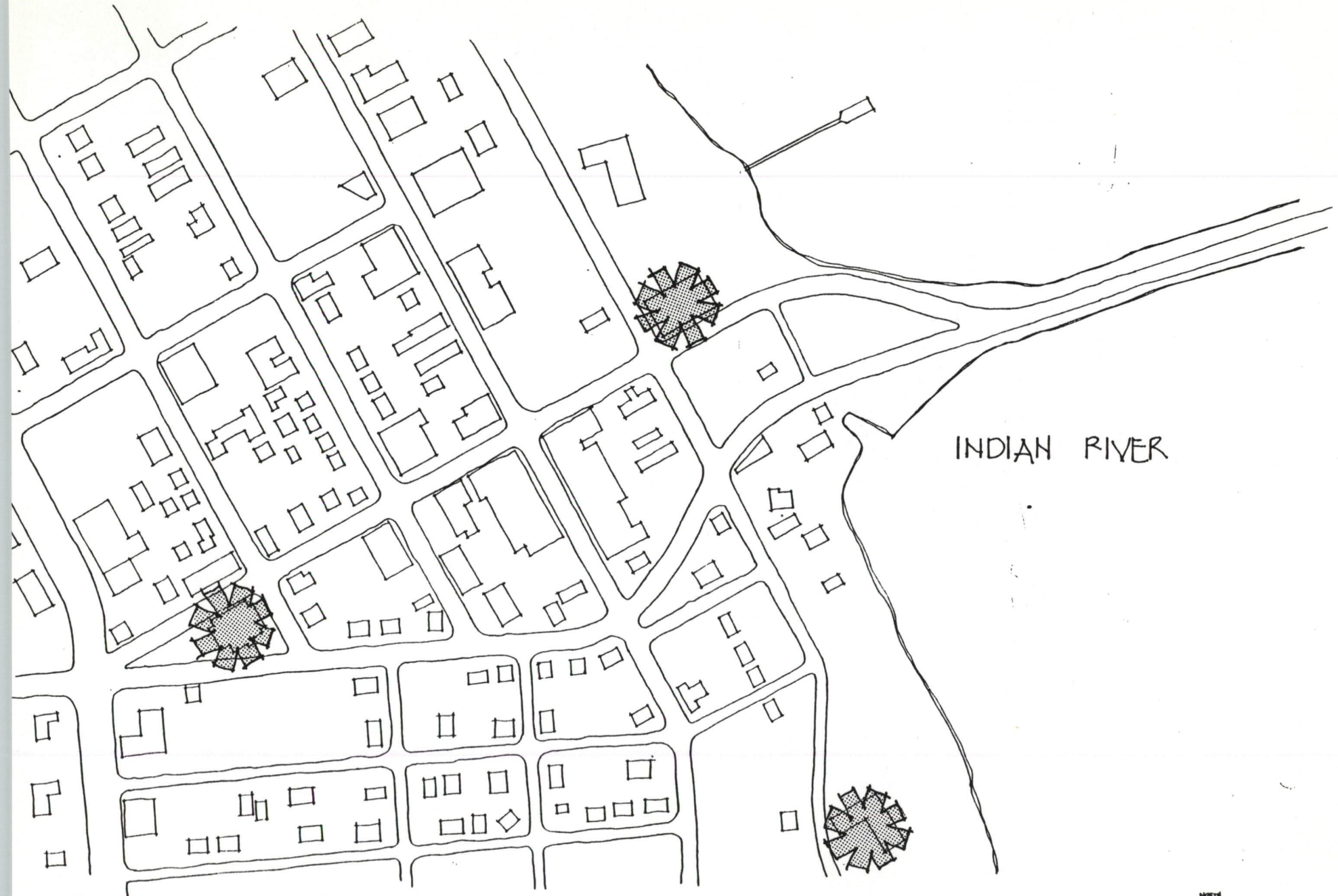


COMMUNITY BUILDINGS

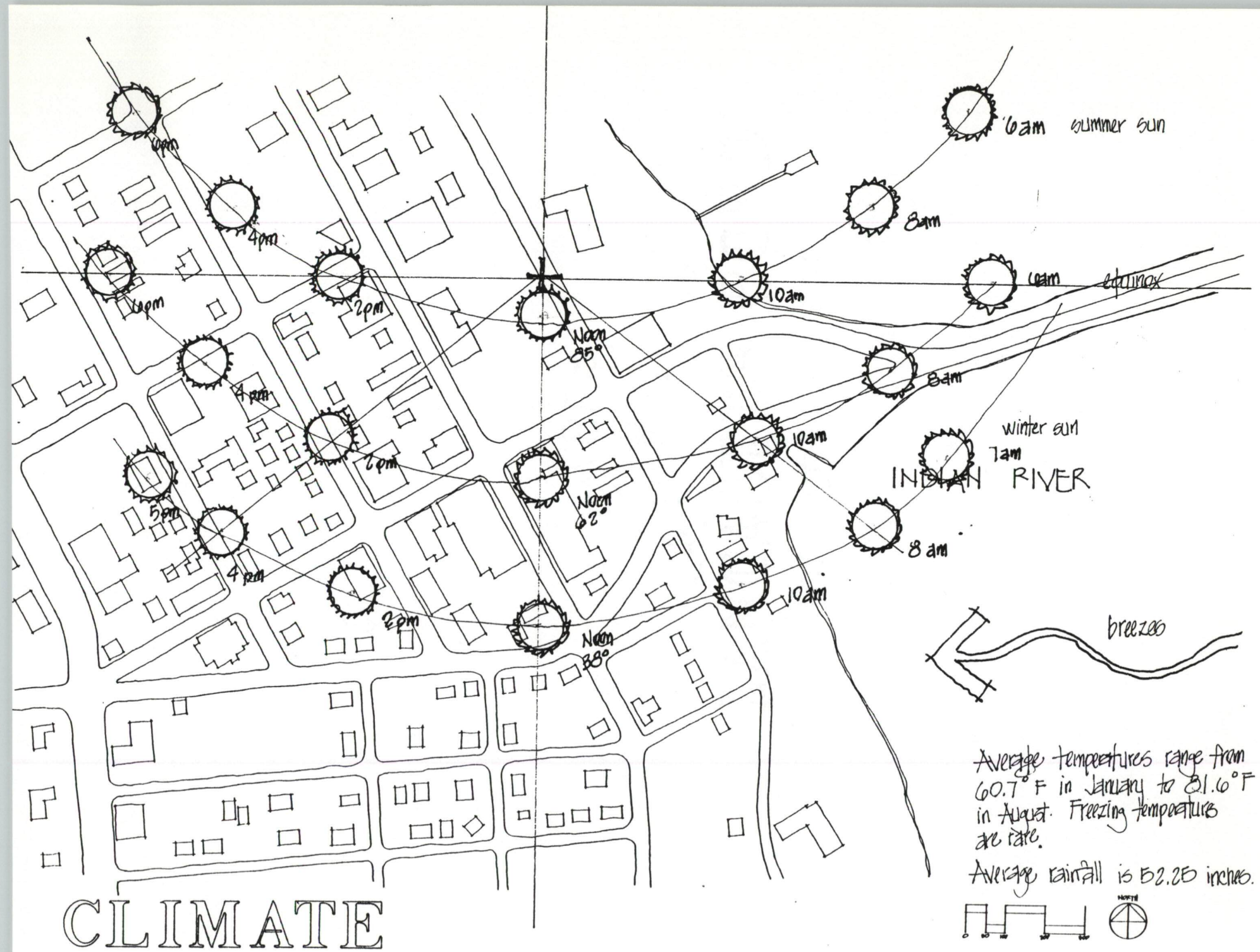


BUILT FORMS


INDIAN RIVER
ASPHALT



DOMINANT BUILDINGS

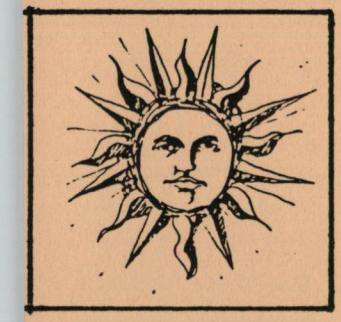


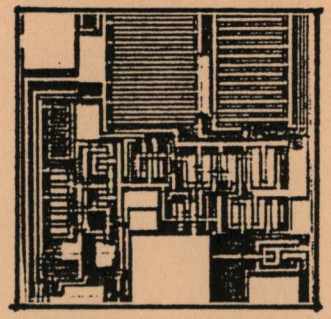
CLIMATE

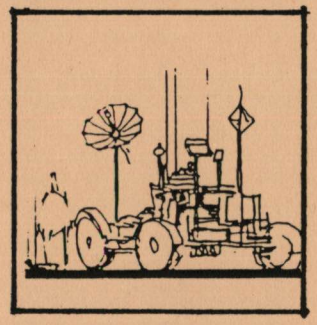
Average temperatures range from 60.7° F in January to 81.6° F in August. Freezing temperatures are rare.

Average rainfall is 52.25 inches.


THE FAMILY CIRCUS
by Bil Keane
please touch MUSEUM
"Go ahead and touch it, P.J....it's all right, honey....You can pick it up, Jeffy...you're allowed! Go on, touch something...."

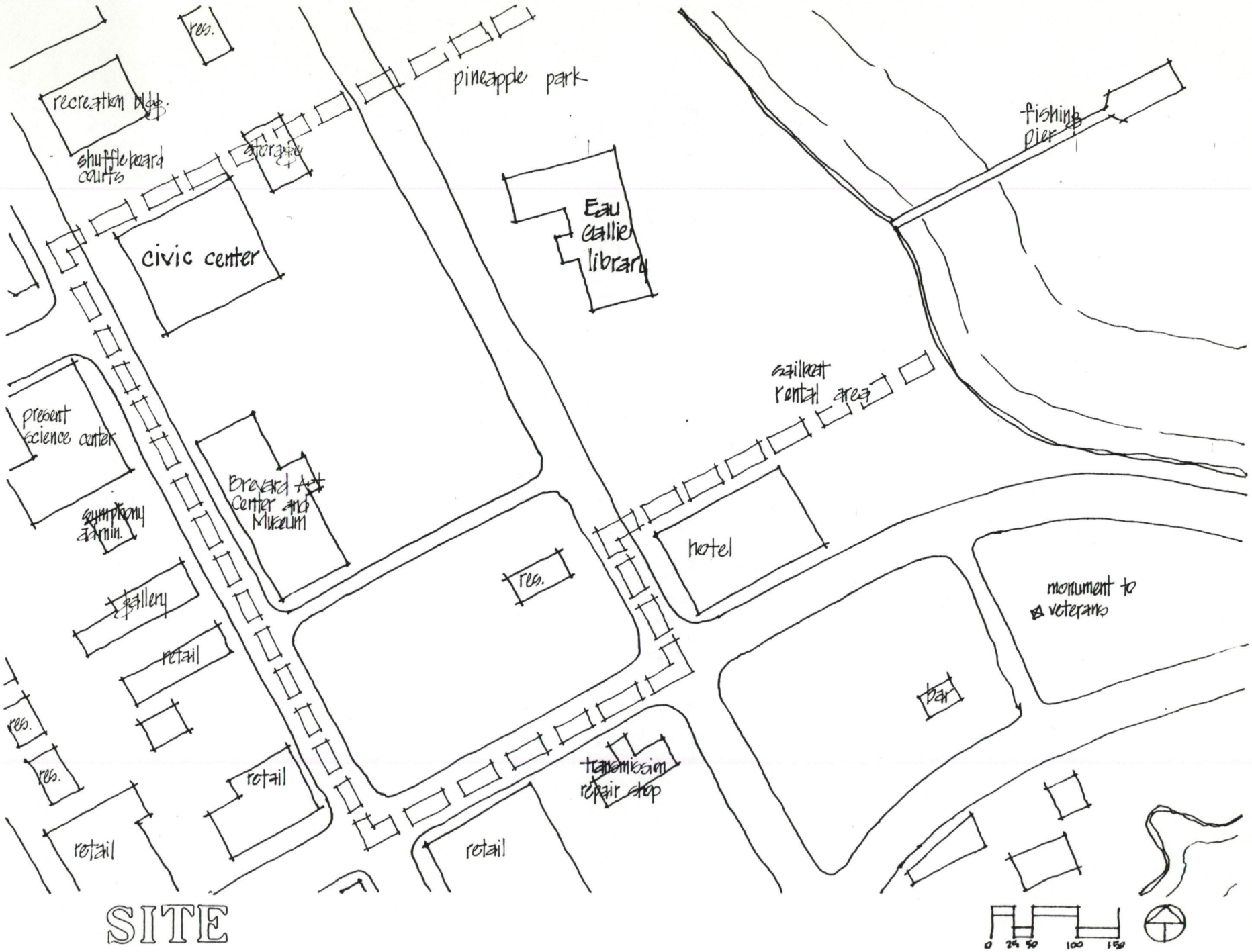


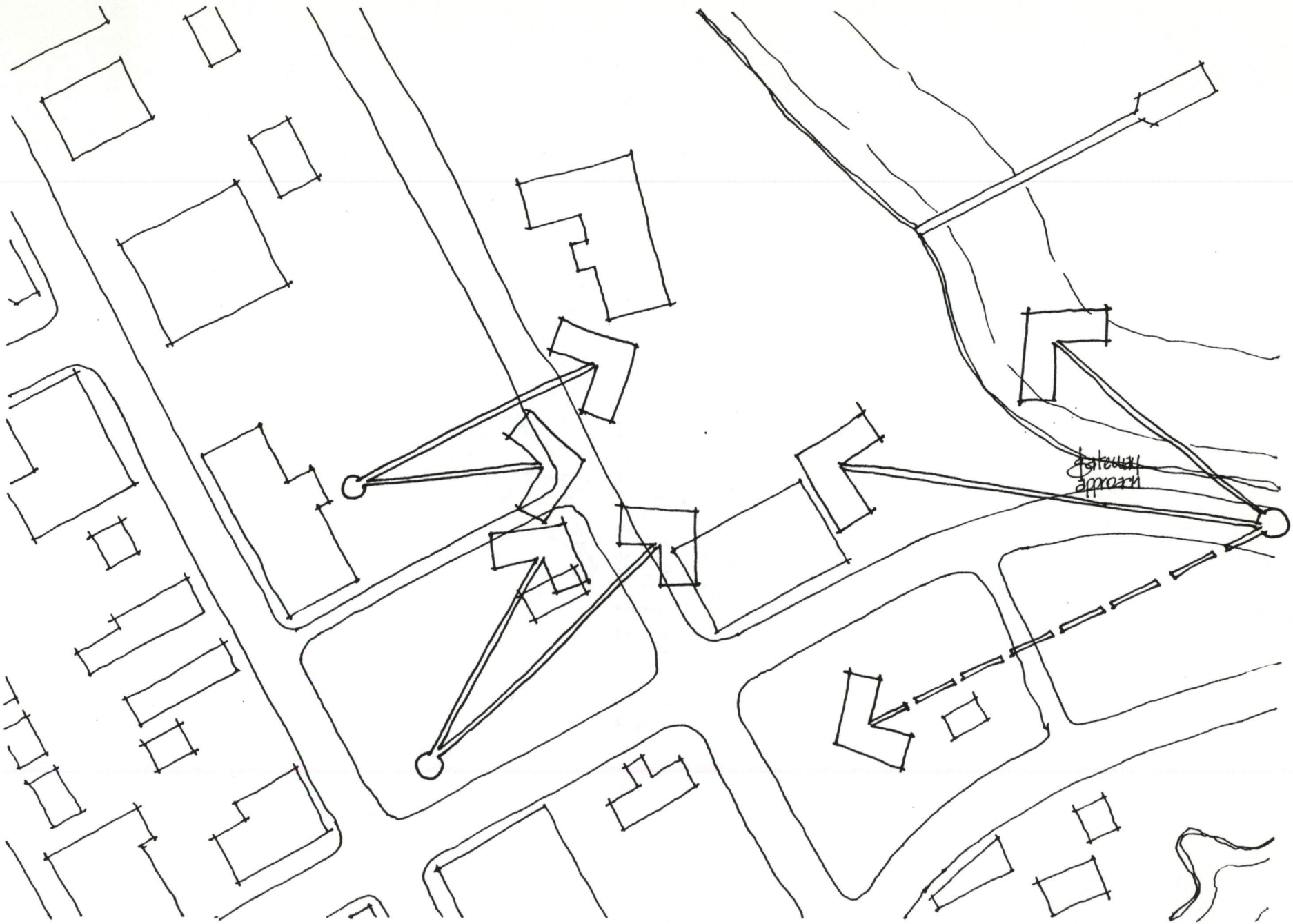





SPIRIT OF SPORTS

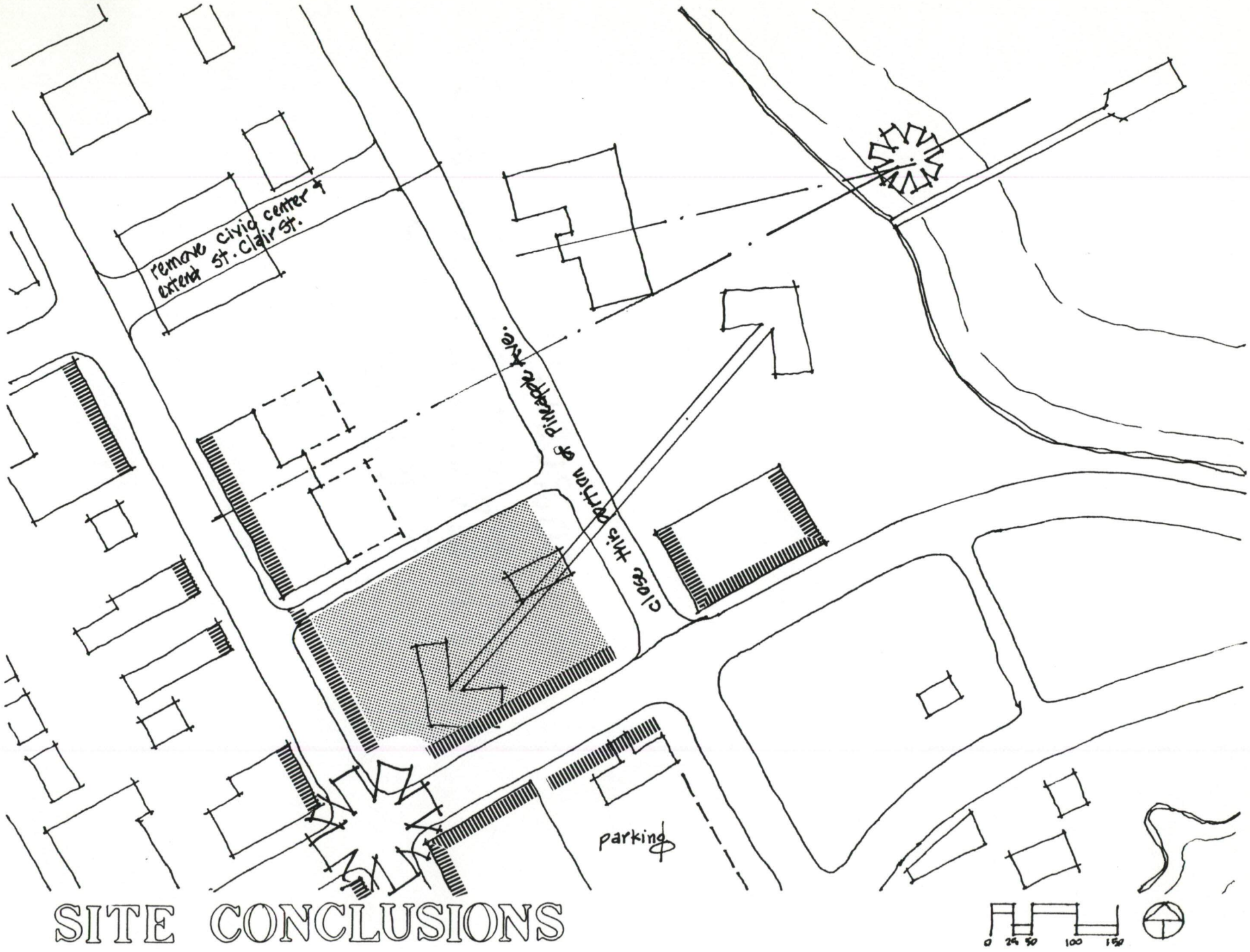
THE SITE


res.
recreation bldg.
pineapple park
shuffleboard courts
storage
civic center
Eau Gallie library
fishing pier
sailboat rental area
present science center
Brevard Art Center and Museum
symphony admin.
gallery
retail
hotel
res.
monument to veterans
bar
res.
res.
retail
transmission repair shop
retail
retail
SITE
0 25 50 100 150

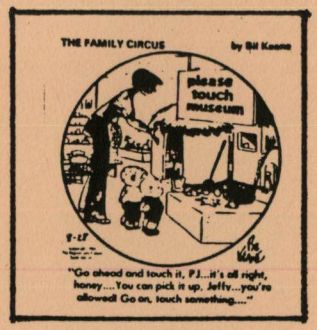


VIEWS


VEGETATION
0
25
50
100
150



SITE CONCLUSIONS


THE FAMILY CIRCUS
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please touch museum
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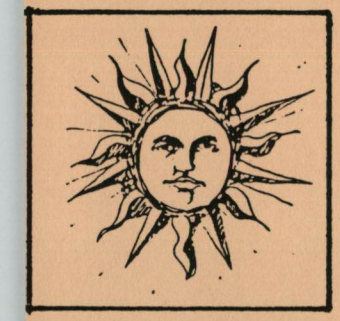
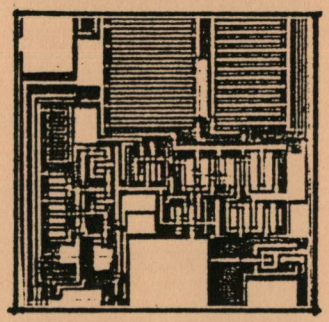
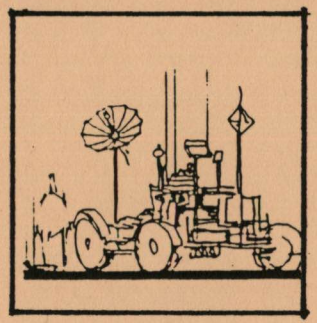
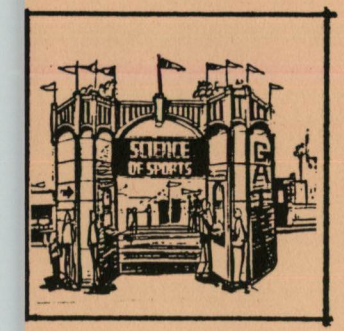
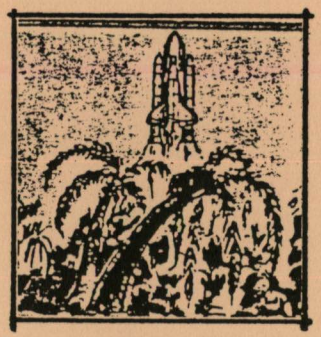






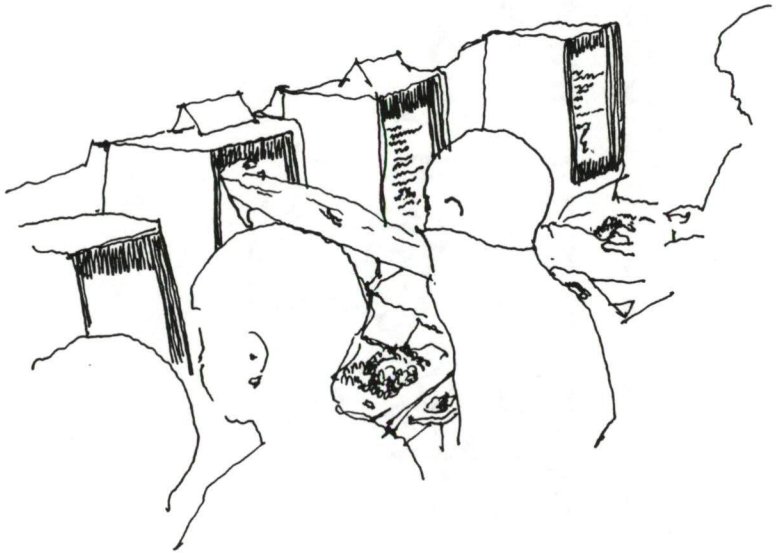

SCIENCE OF SPORTS



PROGRAM

OBJECTIVES.

The major goals of the Space Coast Science Center will be the entertainment and education of its visitors.



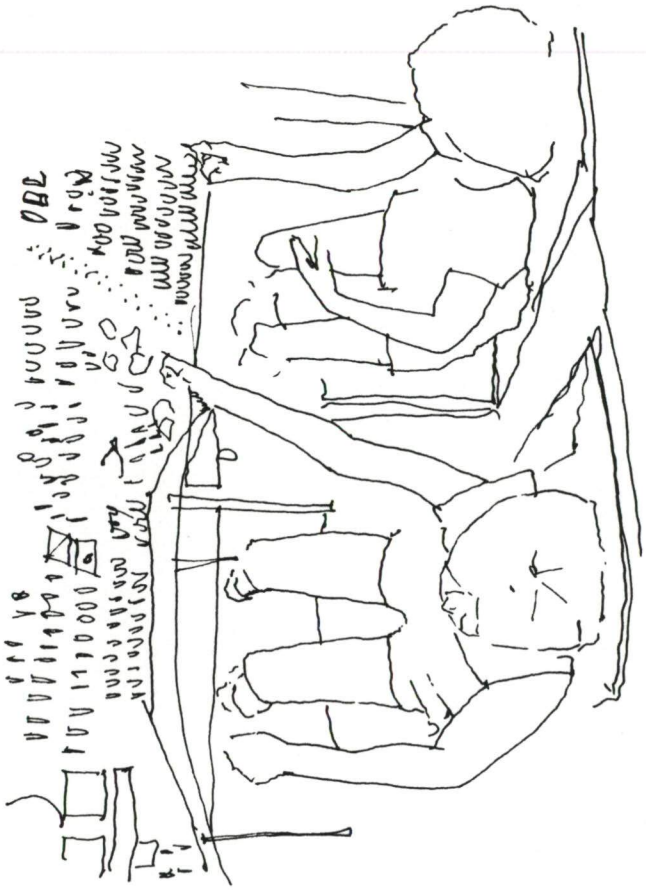
EDUCATING CHILDREN.

In all education the keys are inquiry and discovery. Children are by their nature inquisitive and fascinated by the discoveries that they make as they explore the world around them. Schools function best for sequential learning, but lack the facility for motivating and arousing curiosity. The science center would, therefore, provide an exciting and fun solution to the very serious business of educating children in the field of science. It would be able to present subject matter in a way that is not feasible for the school classroom.

EDUCATING ADULTS

There are rapid changes in the world today that make it very difficult for adults to keep up with current trends that can affect their lives. The science center would allow them to increase their awareness and knowledge in such areas as environmental issues, the tele-communications revolution, personal health, and the sciences.

SCENARIO OF USE BY SCHOOL CHILDREN.



The children are dropped off by school bus near the main entry. They assemble in a line outside of the door while the teacher makes all of the arrangements for them. After getting inside they are given an orientation talk by a member of the science center staff and told that at the end of the day, and if they get lost during the day, they can come back to this designated area. The class may at some point in the day attend a class presentation that the teacher has prearranged to explore the physical, natural, and health sciences, as well as the latest developments in technology. This presentation will be geared to their age and academic level. Before and after that presentation there is a period of free time in which the children may explore and interact with those exhibits that are of particular interest to them. There are also various brief demonstrations that occur throughout the day on the exhibit hall floor that the children can watch. A major interior organizational element keeps the children oriented in the space while allowing maximum freedom to explore. For lunch the group meets back together at their designated area and enjoys their bag lunches in an interior space that overlooks the exhibit space. Many of the children will go to the gift shop for a souvenir or book prior to leaving. After exploring the exhibits in the science center the children get into a circulation "tube" that transports them above ground and then under water to another exhibit / auditorium / observation area ("Observatorium"). When it is time for departure the children exit the "Observatorium" onto a piazza where they wait for their bus to pick them up. Some school groups will want to divide their time between the Space Coast Science Center and the Brevard Art Center and Museum, to get the most out of one field trip.

SCENERIO OF USE BY FAMILY GROUPS.

The family group visiting the Space Coast Science Center would park in the Eau Gallie parking structure and walk pass by the retail shops of Highland Avenue before arriving at the science center. As they approach the center they are first attracted to the exterior displays. After looking at, and interacting with, the exterior exhibits they enter the science center where they purchase the tickets and discuss where they will meet in the event they are separated. The children then race toward the noise, lights, and energy that radiate from the exhibits. The parents also soon become involved in the various "hands-on" exhibits, discovering themselves that the excitement of discovery is not just for children. After an hour or more of interacting with the exhibits, but before moving toward the river and the "Observatorium," the family group visits the gift shop and bookstore to purchase science related gifts and souvenirs. They then visit the "Observatorium" where they can observe Manatee underwater, look through some small telescopes and binoculars at the environment around them. As they leave the science center they may visit the Eau Gallie library to check out a book on a subject that caught their interest during their visit to the science center or they may visit the Brevard Art Center and Museum to see the new exhibit. They also have the opportunity to enjoy a picnic at Pineapple Park on the Indian River and discuss their day of **discovery.**

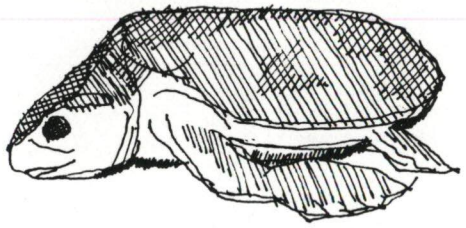


EXHIBIT TYPES. **PROGRAM**

TECHNOLOGY AND INDUSTRY. There would be an opportunity to learn about communications, computers, fiber optics, lasers, mechanics, and areo-space.

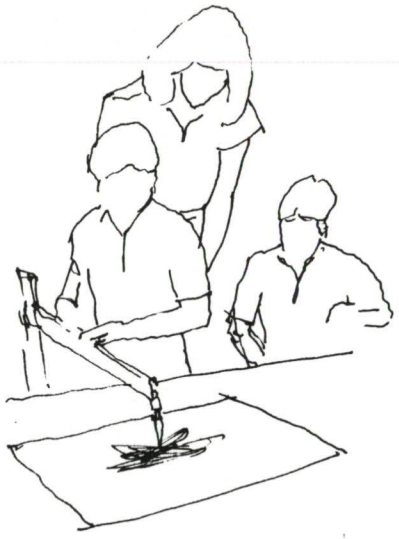
HEALTH AND MEDICINE. This area of the science center would feature learning experiences in personal health, preventive medicine, nutrition, and mental health.

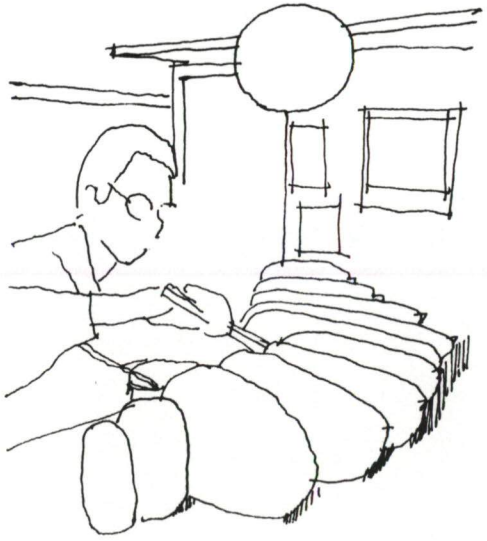
PHYSICAL SCIENCES. There would be the opportunity to interact with exhibits that are concerned with astronomy, chemistry, energy, mechanics, meterology, oceanography, and physics.

NATURAL SCIENCES. The science center would provide learning experiences in anthropology, botony-aquatic, ecology, geology, marine science, oceanography, zoology, amphibians, aquatic, aquarium, birds, reptiles, and common local shells.

TRAVELING EXHIBITS. Traveling exhibits in the fields of science, history, electronics, and others from noted museums such as the Smithsonian would be regular events at the center.

LOCAL EXHIBITS. The center will have a space for local clubs, organizations, and companies to show off their accomplishments. It would include such exhibits as the newest developments in electronic devices to the best shell collections in Florida.





PROJECTED STAFF NEEDS.

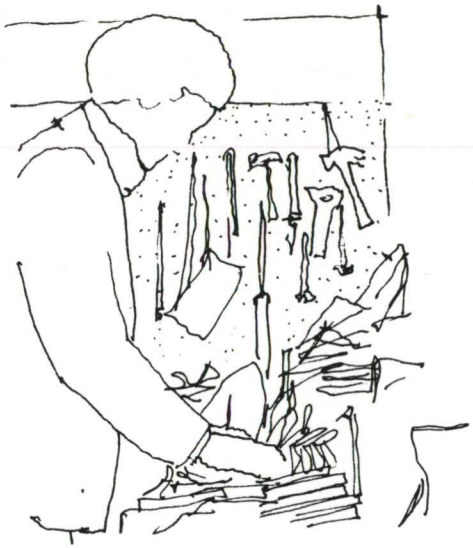
A science center is very dependent on volunteers to assist it in operation. There are also many people on staff that are part time employees from the community, local school districts, and local colleges. The following staff need projections include both full-time and part-time because the implications on the architectural program are equal.

DIRECTOR. It is the responsibility of the director to administer the policies of the science center, manage the operations, and provide the leadership necessary to move the science center forward. The director's work includes the management of programs, funds, and people. It involves working with the community, the schools, the board of directors, and contributors. DIRECTOR / EXECUTIVE SECRETARY.

EXHIBITS DEPARTMENT. Due to the importance of exhibits at a hands-on science center, this is one of the most active departments. This department is charged with the development and maintenance of the permanent exhibits and the scheduling and handling of the traveling exhibits. This work involves the design and construction of exhibits and the contracting of outside designers and constructors for other work. They are also responsible for the museum graphics and publication design. EXHIBITS DIRECTOR / EXHIBITS DESIGNER / EXHIBITS ENGINEER / GRAPHIC ARTIST.

EDUCATION DEPARTMENT. The education department is responsible for the coordination of the educational activities of the science center. Its concerns include exhibit tours, educational courses, lectures, summer programs, science demonstrations, and other educational activities of the center. EDUCATION DIRECTOR.

BUSINESS DEPARTMENT. The business department is responsible for the accounting, payroll, and budgeting activities as well as other business matters. BUSINESS MANAGER / ACCOUNTANT / SALES SHOP AND ADMISSIONS SUPERVISOR.



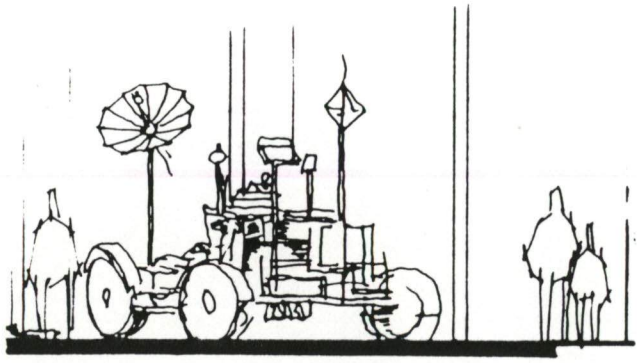
DEVELOPMENT DEPARTMENT. The development office is concerned with raising funds and the promotion of the science center. It is important to keep the employees, members, volunteers, and the general public informed of the activities of the institution. It is also their responsibility to keep funds coming into the science center. DEVELOPMENT DIRECTOR / DEVELOPMENT SECRETARY / MEMBERSHIP SECRETARY / PUBLIC RELATIONS SPECIALIST.

OTHER STAFF REQUIRED. SECURITY / BUILDINGS MANAGER / VOLUNTEER COORDINATOR.

EXHIBITION SPACE.

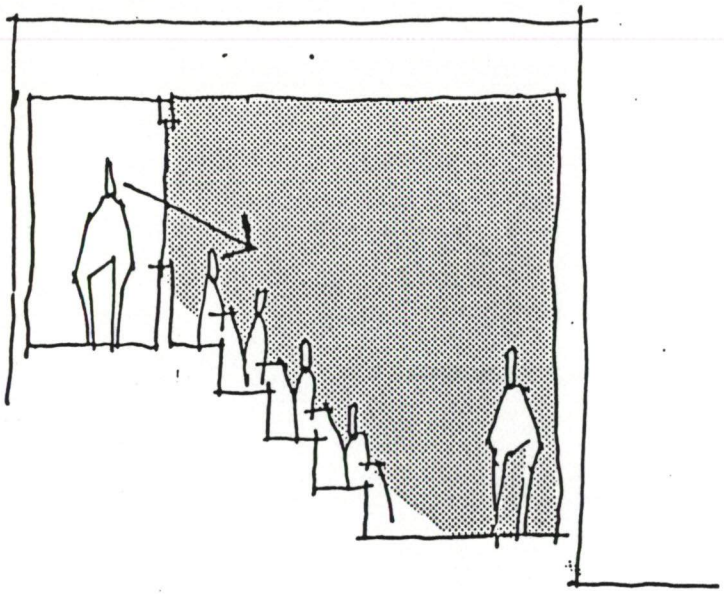
The exhibition space will be the main space in the science center. By the nature of hands-on learning exhibits the space will be a lively space with much noise from people and machines. It will be a secure and ticketed area that will be the emphasis of the visitor's trip to the science center.

The space will contain two different types of exhibits, permanent exhibits and traveling, temporary exhibits. The traveling exhibits are often built by other science and technology centers or are on loan from the Smithsonian or similar resources. People will be encouraged to visit these traveling exhibits each time they change and should, upon visiting, be encouraged to visit the permanent exhibits to explore new exhibits, ones that they hadn't seen before, or old favorites. Permanent exhibits that are moveable are often moved around to attract attention to different exhibits. Thus, the type of space required for the two types of exhibits will be very similar. They require flexible, open space with total control of the lighting.



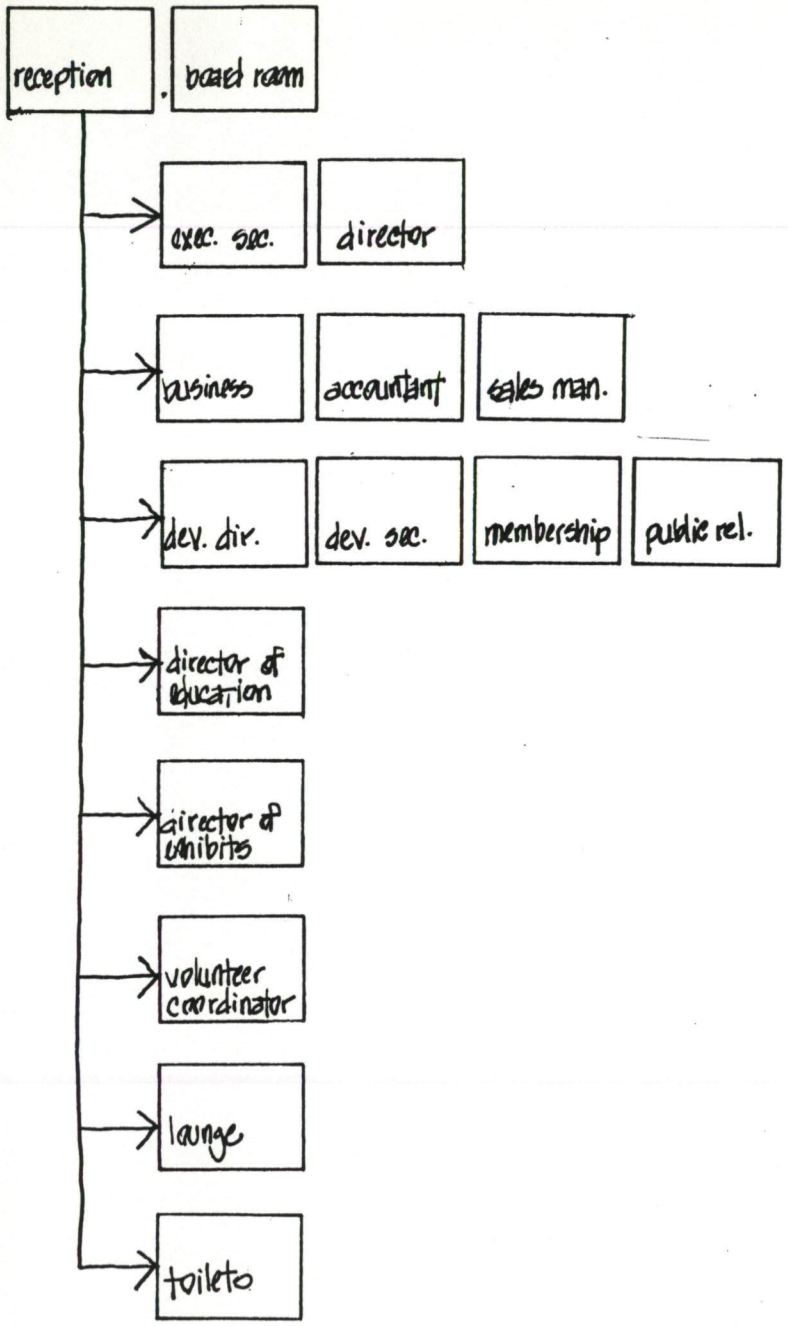
There will also be an exterior exhibit space that will contain large exhibits such as boats, trains, or space craft. This area will be available to the public and will not be either secure or ticketed. It should take full advantage of the Indian River.

CLASSROOMS.



The classrooms will serve as spaces for class presentations and demonstrations. The character of the space should provide an intimate relationship between the pupil and the teacher in order to facilitate discussion. There should also be an observation area in a few classrooms, with observation through a one way mirror. This will allow for the students to be observed by the teacher so that the teacher is aware of what they were taught without necessarily being in the room. It would also allow parents of a student who is being taught about a particular subject, such as sex education, to observe the class presentation without the student's awareness of the parent's presence. Because school groups will visit the museum in groups of either thirty-five, which is one class, or seventy, which is two classes and one bus load, the capacity of the rooms should respond to these size groups.

Two classrooms that seat 35 students	800 sq.ft.
One classrooms that seat 70 students	960 sq.ft.
total	1760 sq.ft.

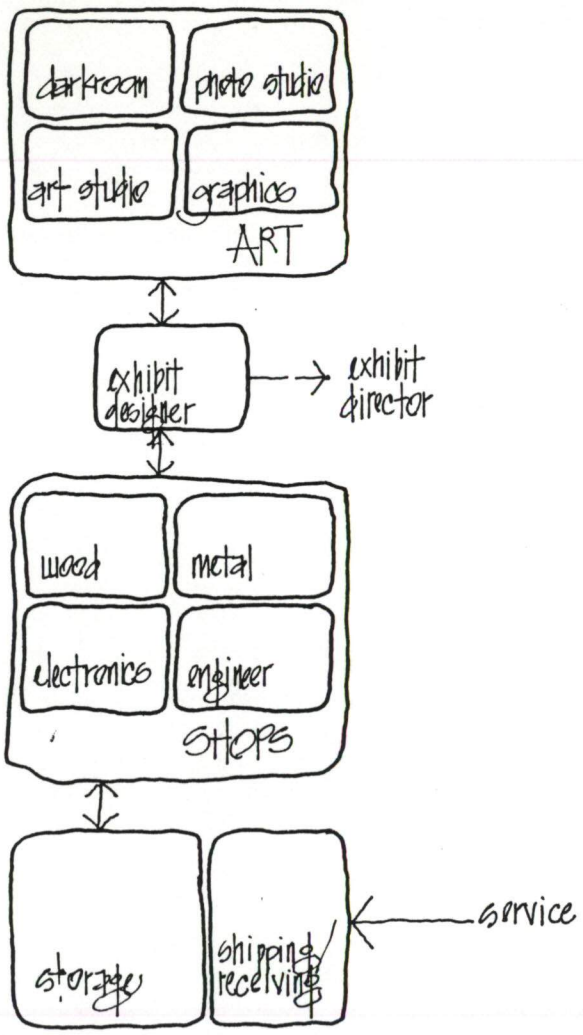


ADMINISTRATION **PROGRAM**

The administrative area is designed based on the projected staff requirements. Because science centers depend on volunteers, it is difficult to determine which positions will be filled with paid staff and which will be volunteers. It is also difficult to determine which jobs will be part-time as opposed to those that are full-time. Since the implications on the architectural program are basically the same, space is provided for all positions that are projected as necessary, which allows for some growth in the administrative staff as the center requires. The Administrative area of the facility should be a semi-private area, meaning that it is reasonably accessible to the public.

Reception Area	400 sq.ft.
Meeting Room for the Board of Directors	900 sq.ft.
Executive Secretary	200 sq.ft.
Director	400 sq.ft.
Director of Exhibits	300 sq.ft.
Director of Education	300 sq.ft.
Business Manager	250 sq.ft.
Accountant	150 sq.ft.
Sales Shop and Admissions Supervisor	150 sq.ft.
Director of Development	300 sq.ft.
Development Secretary	100 sq.ft.
Membership Secretary	250 sq.ft.
Public Relations Specialist	250 sq.ft.
Volunteer Coordinator	300 sq.ft.
Office Assistants	500 sq.ft.
Office Storage	300 sq.ft.
Staff Toilets	200 sq.ft.
Staff Lounge	300 sq.ft.
Volunteer lounge	700 sq.ft.
Volunteer Lockers and Toilets	700 sq.ft.

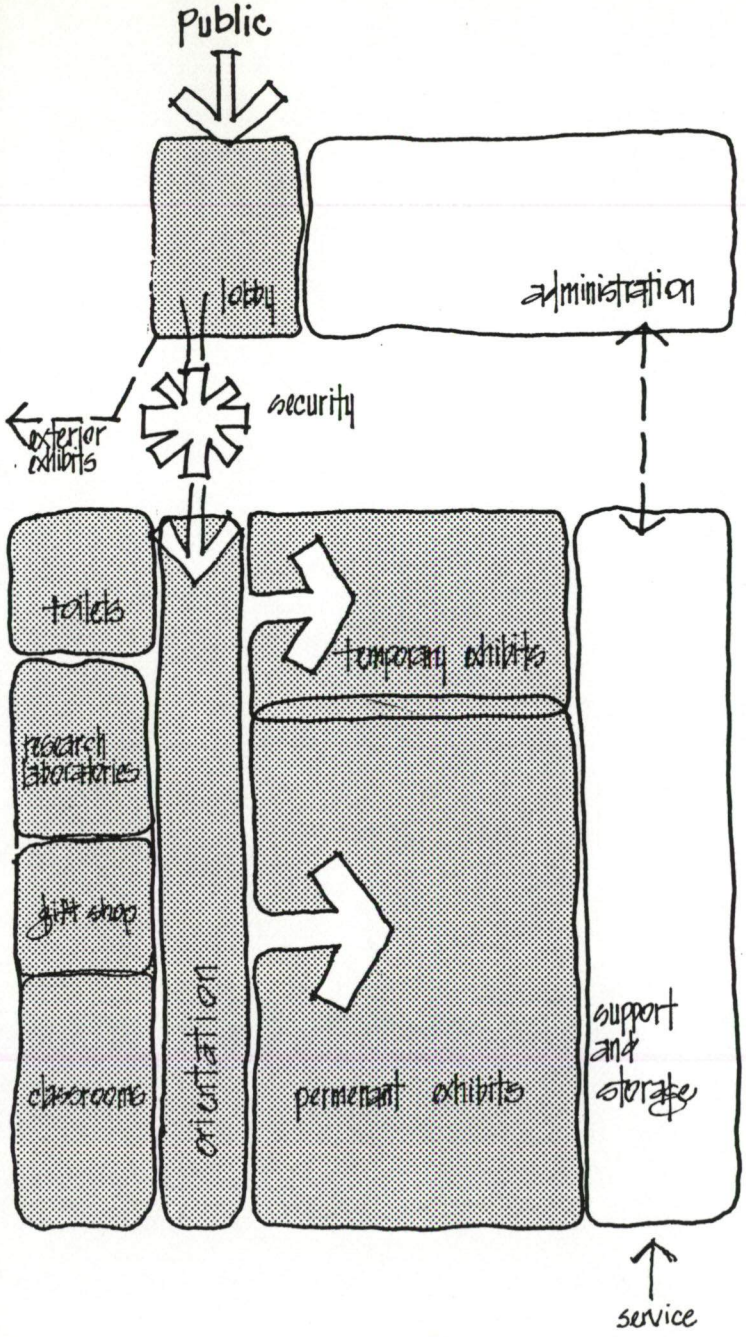
total 7050 sq.ft.



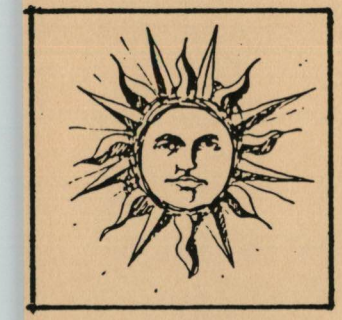
SUPPORT SPACE. **PROGRAM**

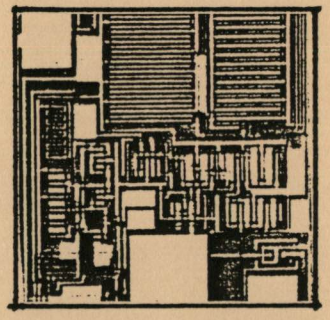
The support space is required for the preparation and maintenance of exhibits. Because many science centers design and build their own exhibits, it is also a space for these activities to occur. It is desirable to have some of the shops and building systems, such as the mechanical system, exposed to the visitor in order that these "behind the scenes" activities and machines would become a learning experience. The visibility of the shops to the visitor would also serve as a reminder that the center's exhibits are constantly changing.

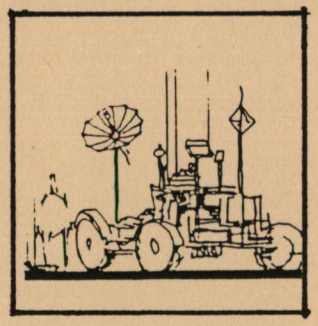
Exhibits Designer	400 sq.ft.
Graphic Designer	300 sq.ft.
Art Studio	300 sq.ft.
Darkroom	200 sq.ft.
Photography Studio	350 sq.ft.
Exhibits Engineer	300 sq.ft.
Wood Shop	3000 sq.ft.
Electronics Shop	600 sq.ft.
Metal Shop	1000 sq.ft.
Storage	5000 sq.ft.
Shipping and Receiving	1000 sq.ft.
Staff Toilets	200 sq.ft.
Building Manager	200 sq.ft.
total	12,850 sq.ft.



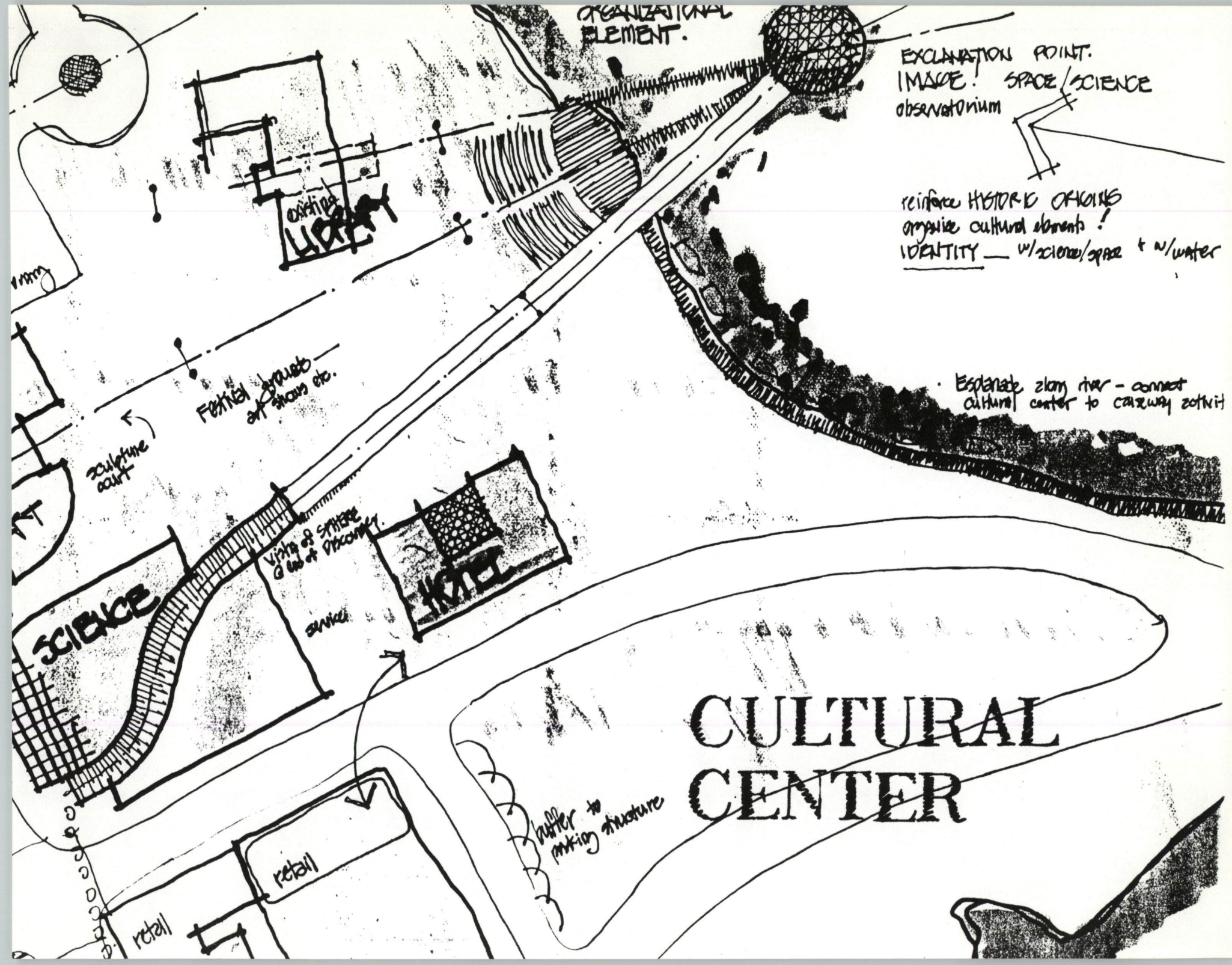
SUMMARY.		PROGRAM
LOBBY.		2,000 sq.ft.
EXHIBITION HALL.		17,600 sq.ft.
LOCAL EXHIBIT AREA.		2,000 sq.ft.
TRAVELING EXHIBIT AREA.		2,400 sq.ft.
ADMINISTRATION.		7,050 sq.ft.
SUPPORT AREAS.		12,850 sq.ft.
CLASSROOMS.		1,760 sq.ft.
RESEARCH LABORATORIES.		300 sq.ft.
GIFT SHOP AND BOOK STORE.		1,500 sq.ft.
SNACK AREA.		1,000 sq.ft.
	net	43,460 sq.ft.
	add 30% for mechanical and circulation	
	gross	63,000 sq.ft.
EXTERIOR DISPLAY AREA	min.	5,000 sq.ft.

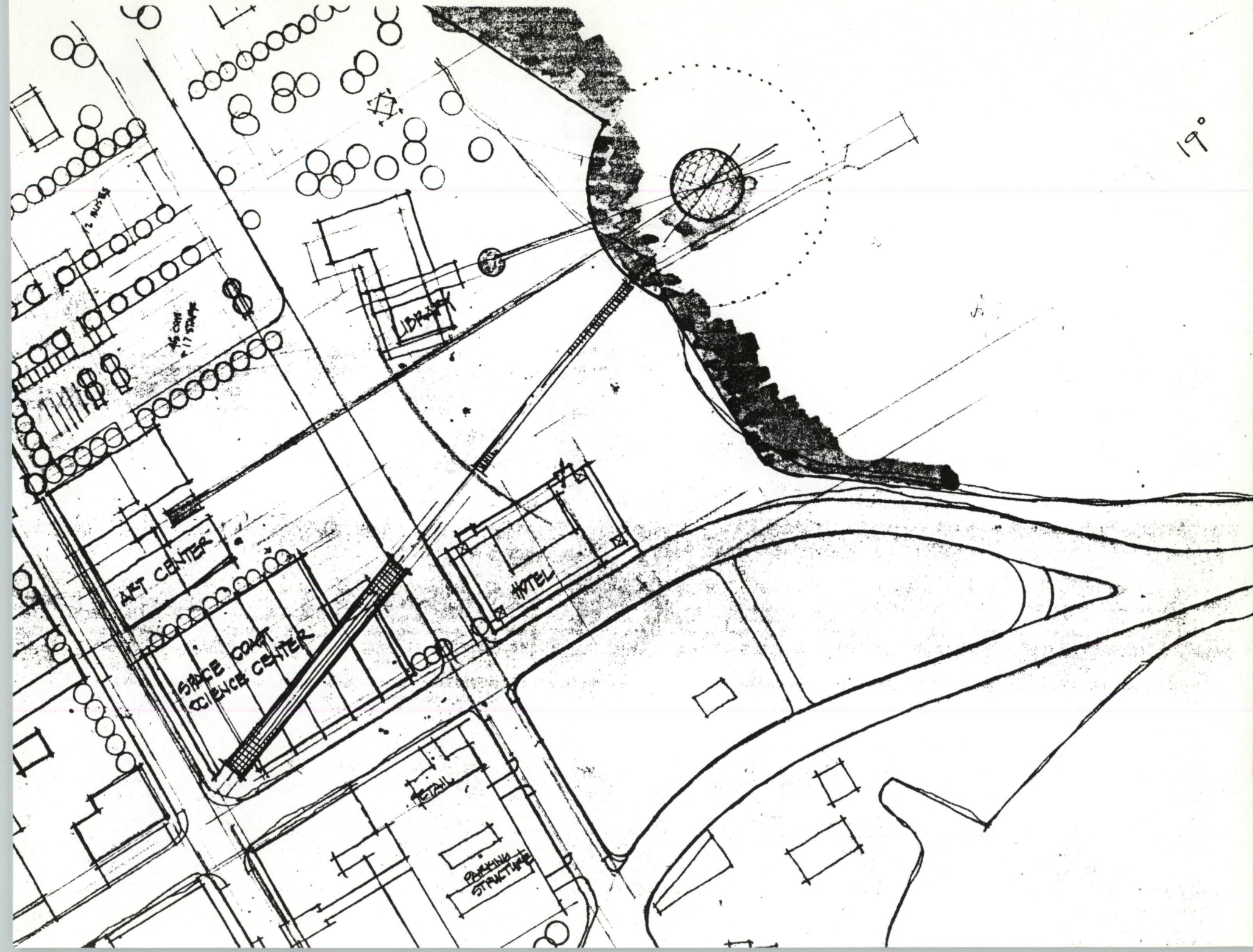






DESIGN EVOLUTION


ORGANIZATIONAL ELEMENT.
EXCLAMATION POINT.
IMAGE: SPACE/SCIENCE
observatorium
reinforce HISTORIC ORIGINS
organize cultural elements!
IDENTITY — w/science/space & w/water
existing
FESTIVAL grounds
art shows etc.
sculpture court
Esplanade along river - connect cultural center to causeway activit
vista of sphere & at discovery.
service
SCIENCE
buffer to parking structure
retail
retail
CULTURAL CENTER

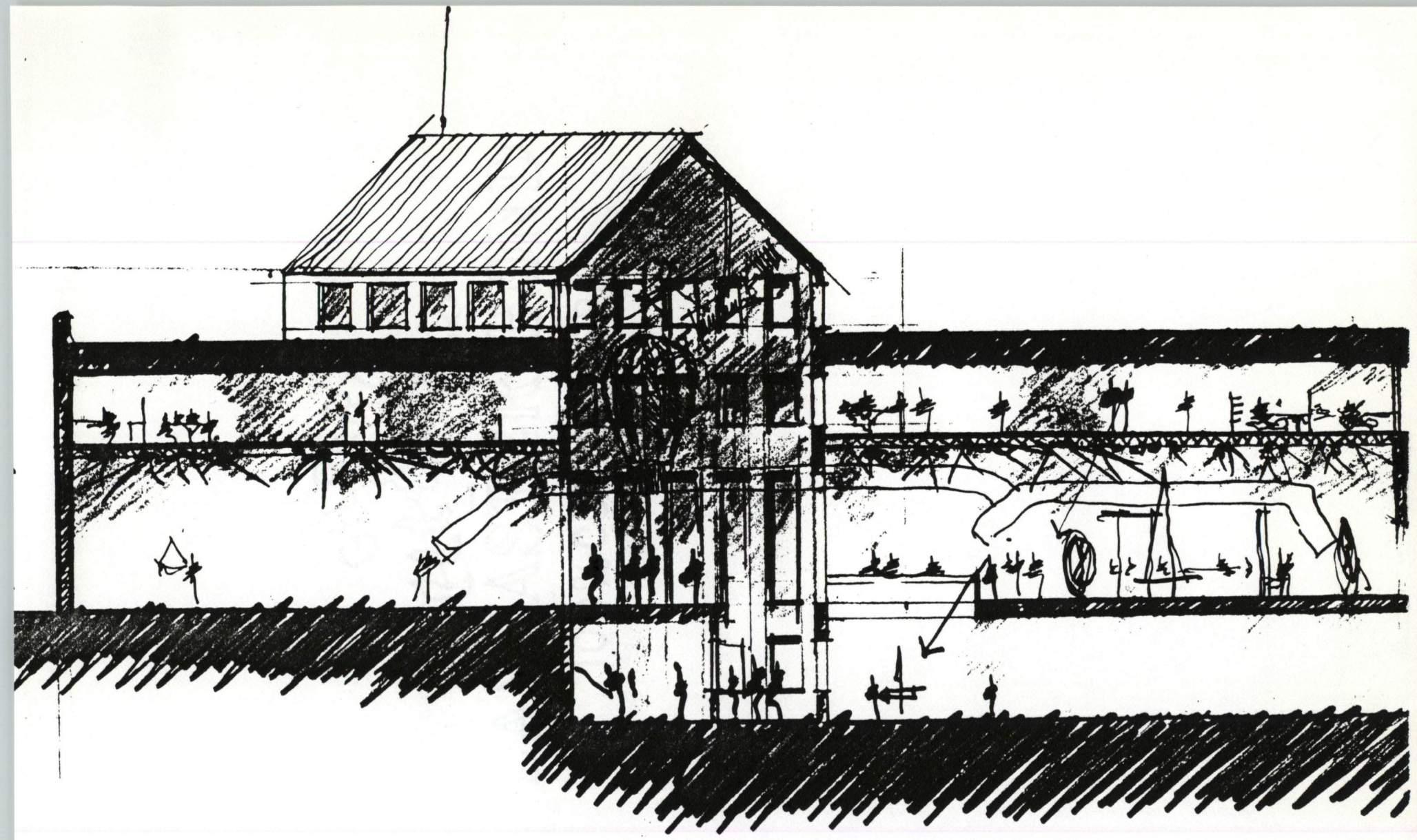

AFT CENTER
SPACE COAST SCIENCE CENTER
HOTEL
RETAIL
PARKING STRUCTURE

TEWAY to the Eau Gallie District

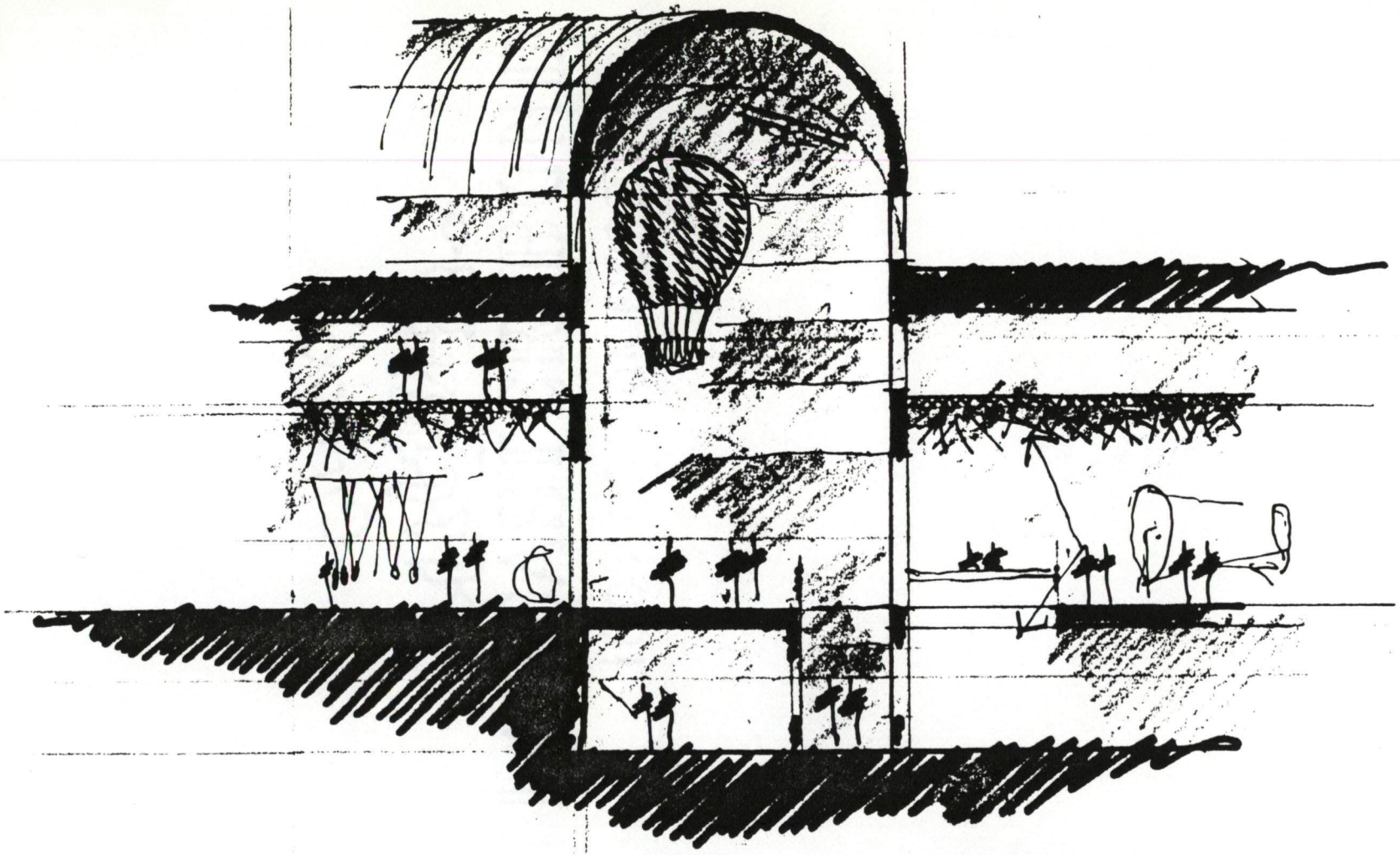
e.
facade to brick exhibit wall

IMAGE

Eau Gallie. SPACE COAST.
.... of Science!

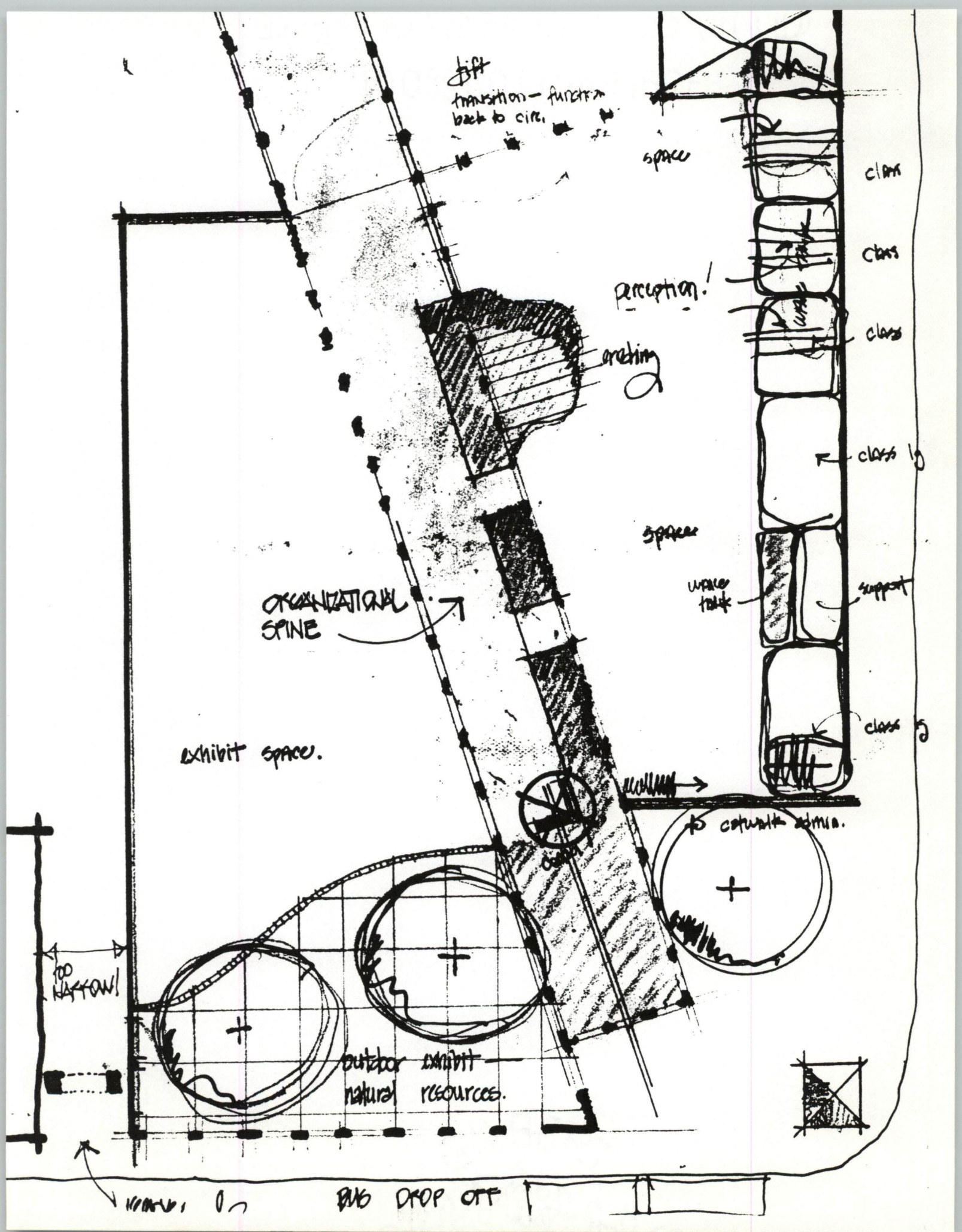


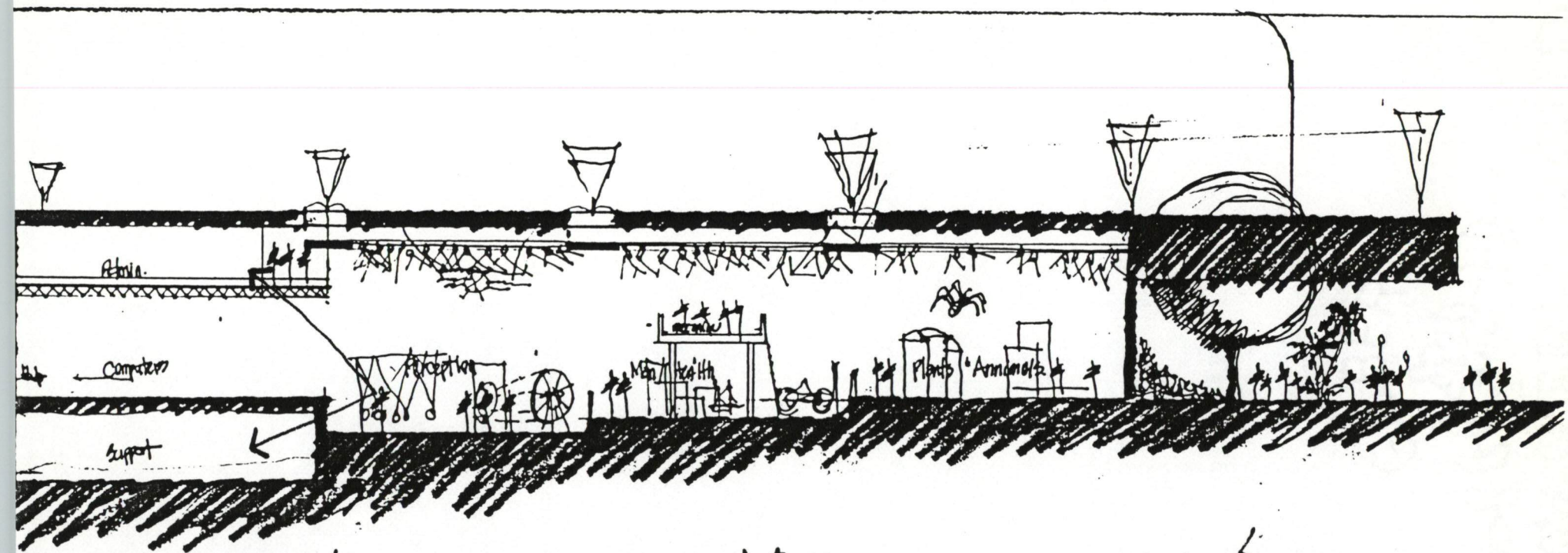
SECTION



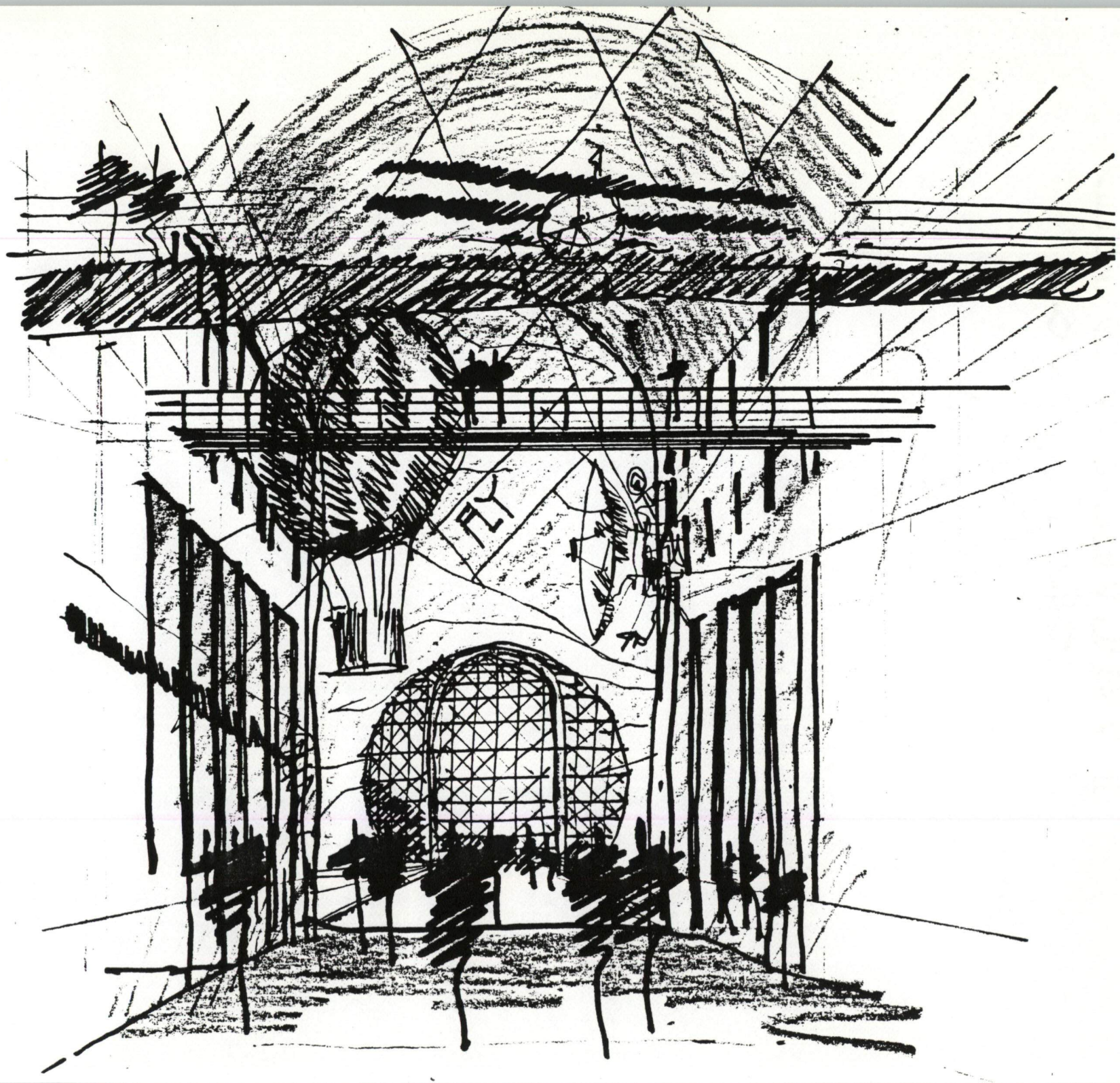
ESSENCE OF SCIENCE : DISCOVERY!

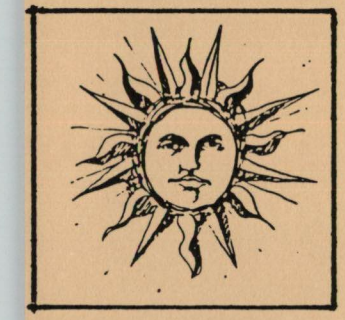
"Science is to see what everyone else has seen
And think what no one else has thought...."
Albert Szent-Gyorgyi.

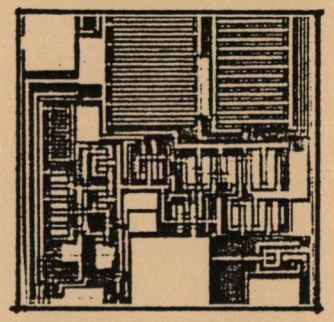

lift
transition – further back to circ.
space
class
class
perception!
class
arching
class
space
water tank
support
ORGANIZATIONAL SPINE
class
exhibit space.
to catwalk admin.
too narrow!
outdoor exhibit
natural resources.
BUS DROP OFF

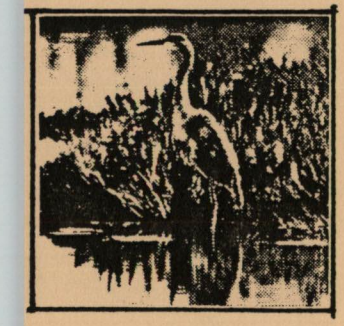


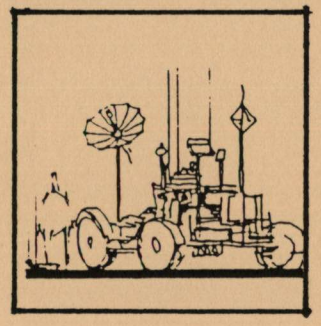
the buildings as EXHIBIT! exposing the science of the buildings ↑ at the science center. A world of DISCOVERY.

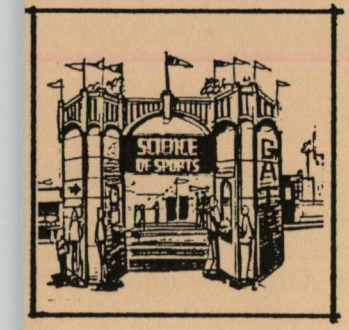










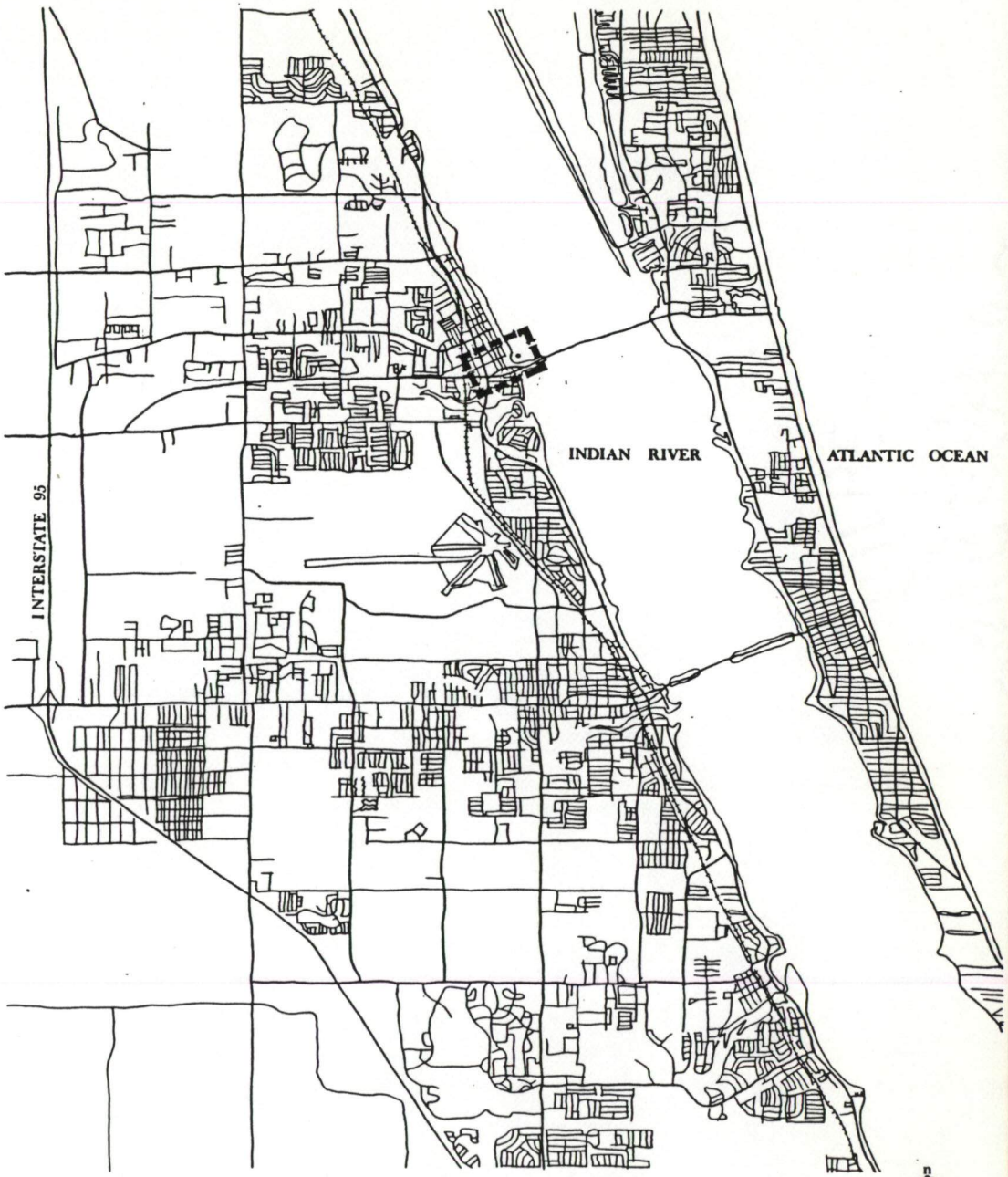


DESIGN SOLUTION

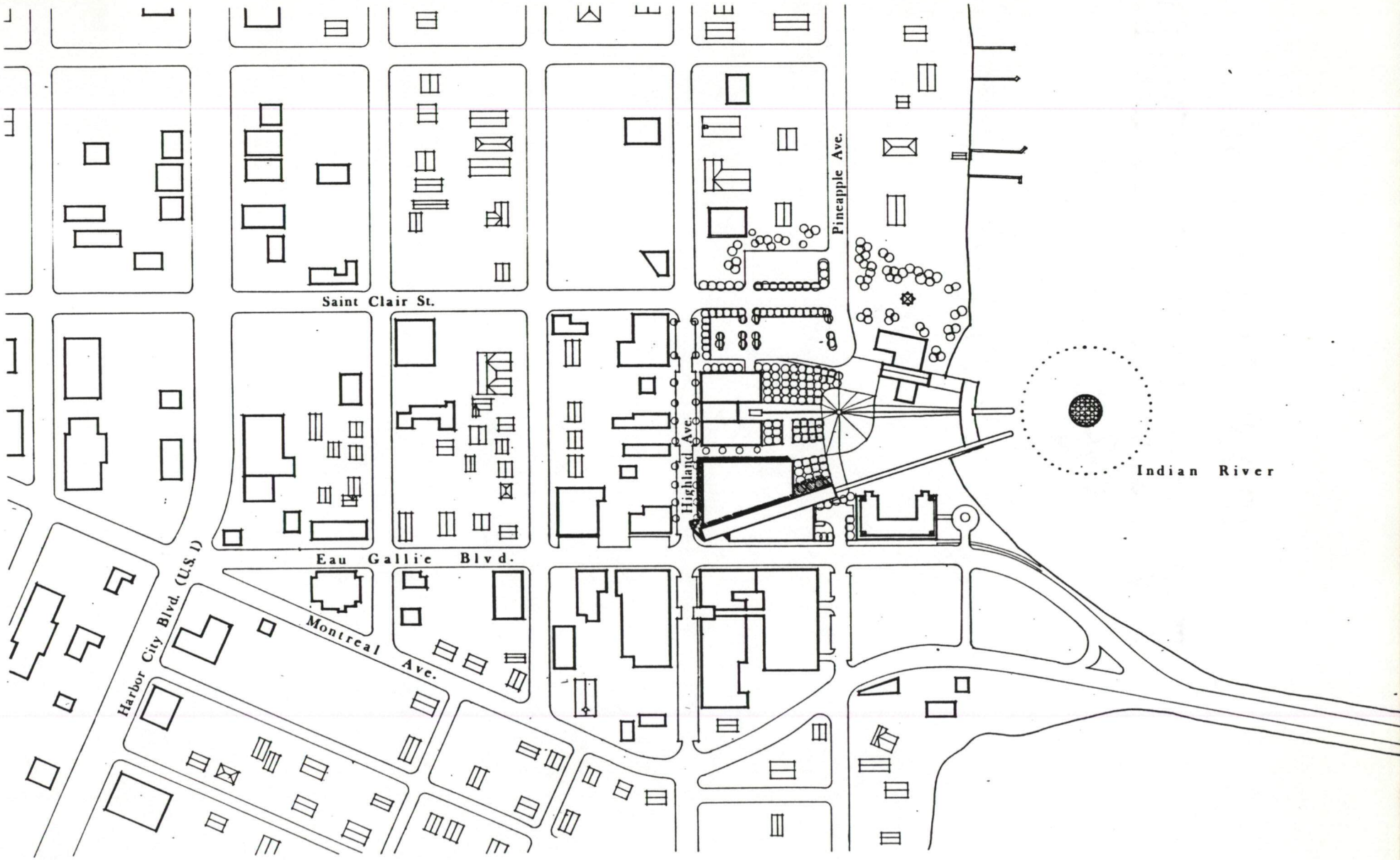
SPACE COAST SCIENCE CENTER

MASTER'S DESIGN PROJECT SPRING 1986

d. wayne rogers



MELBOURNE, FL.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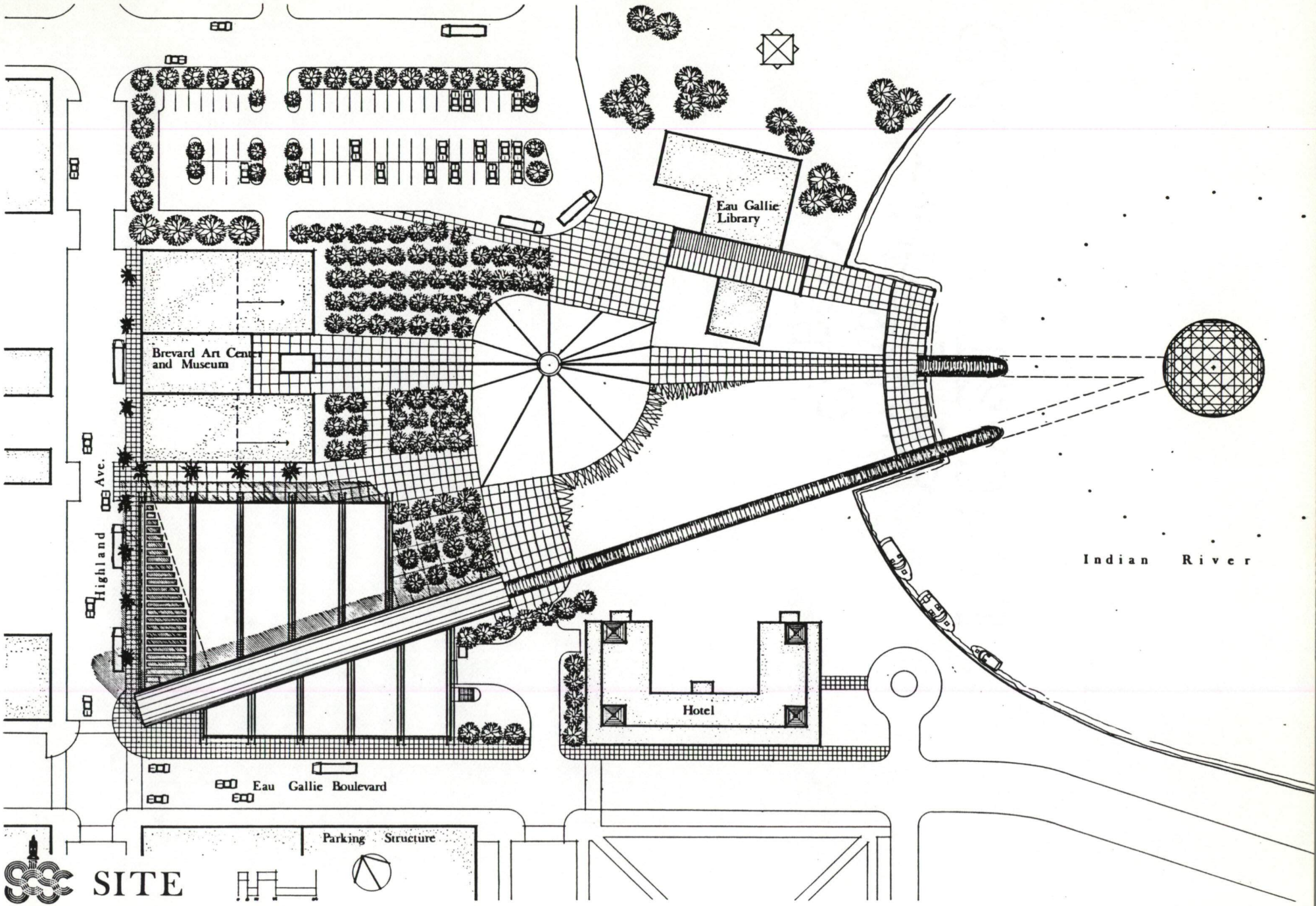
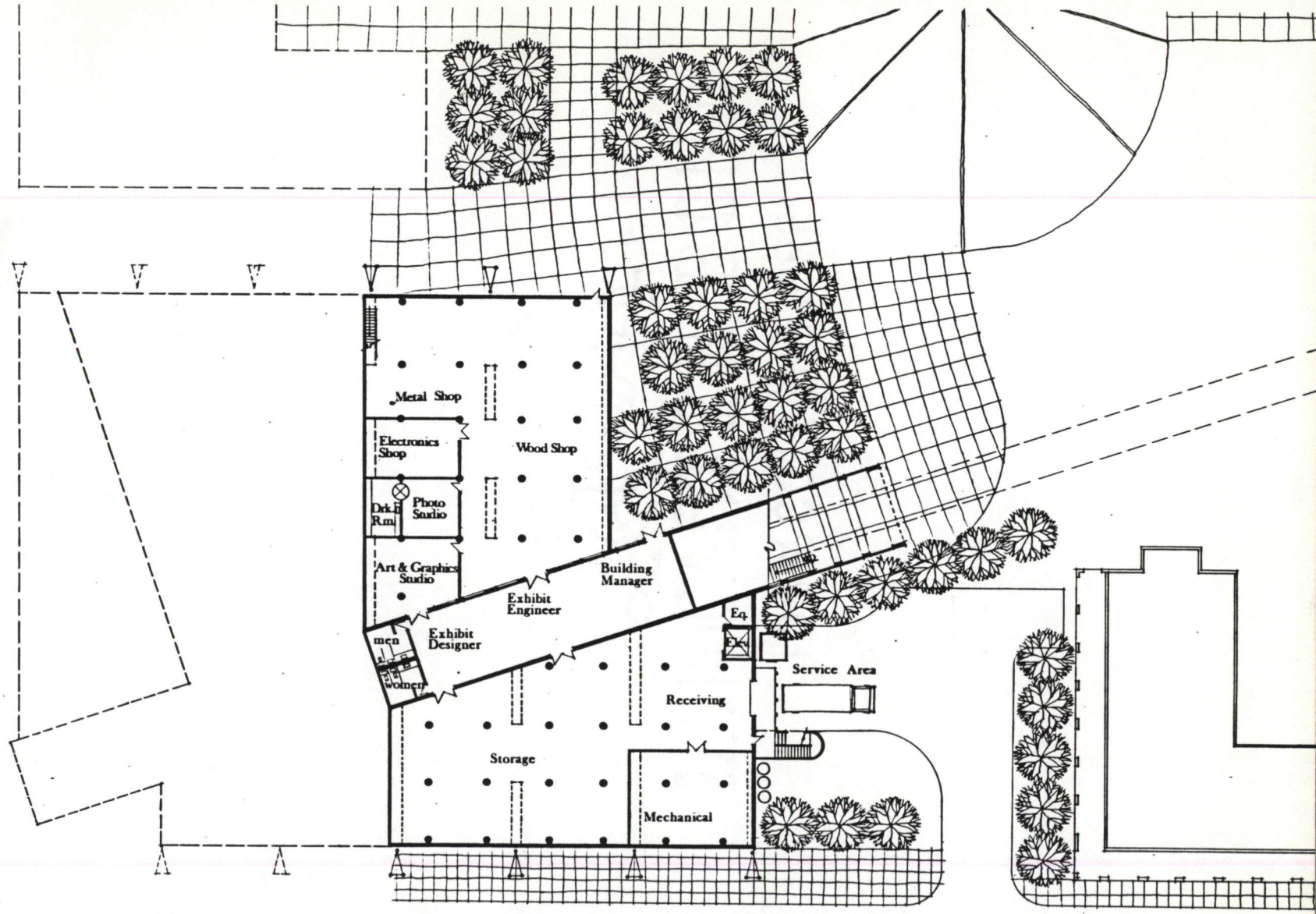
Eau Gallie Blvd.
Harbor City Blvd. (U.S. 1)
Montreal Ave.
Highland Ave.
Pineapple Ave.
Indian River

CONTEXT


Eau Gallie Library
Brevard Art Center and Museum
Highland Ave.
Indian River
Hotel
Eau Gallie Boulevard
Parking Structure
SITE



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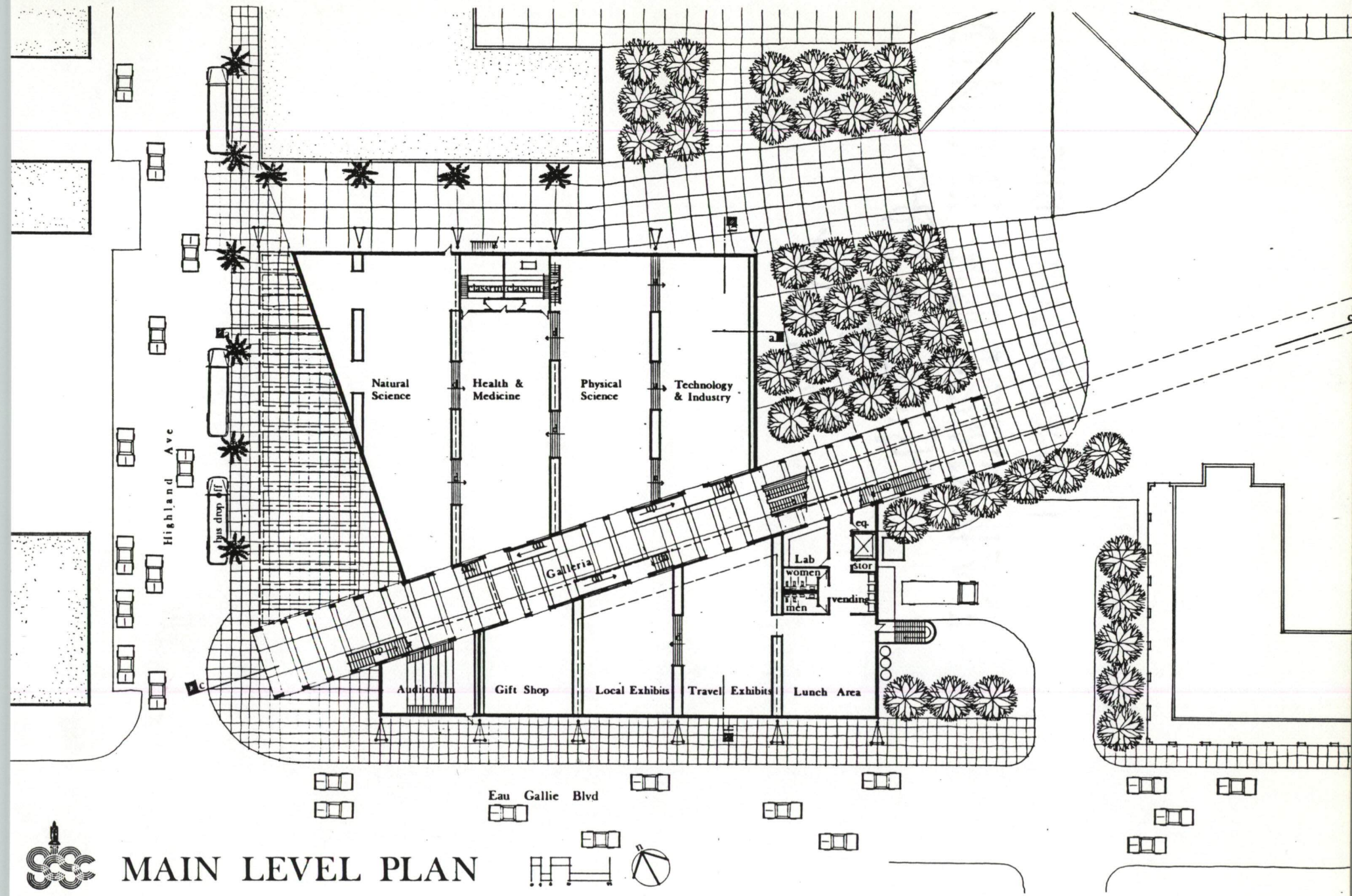

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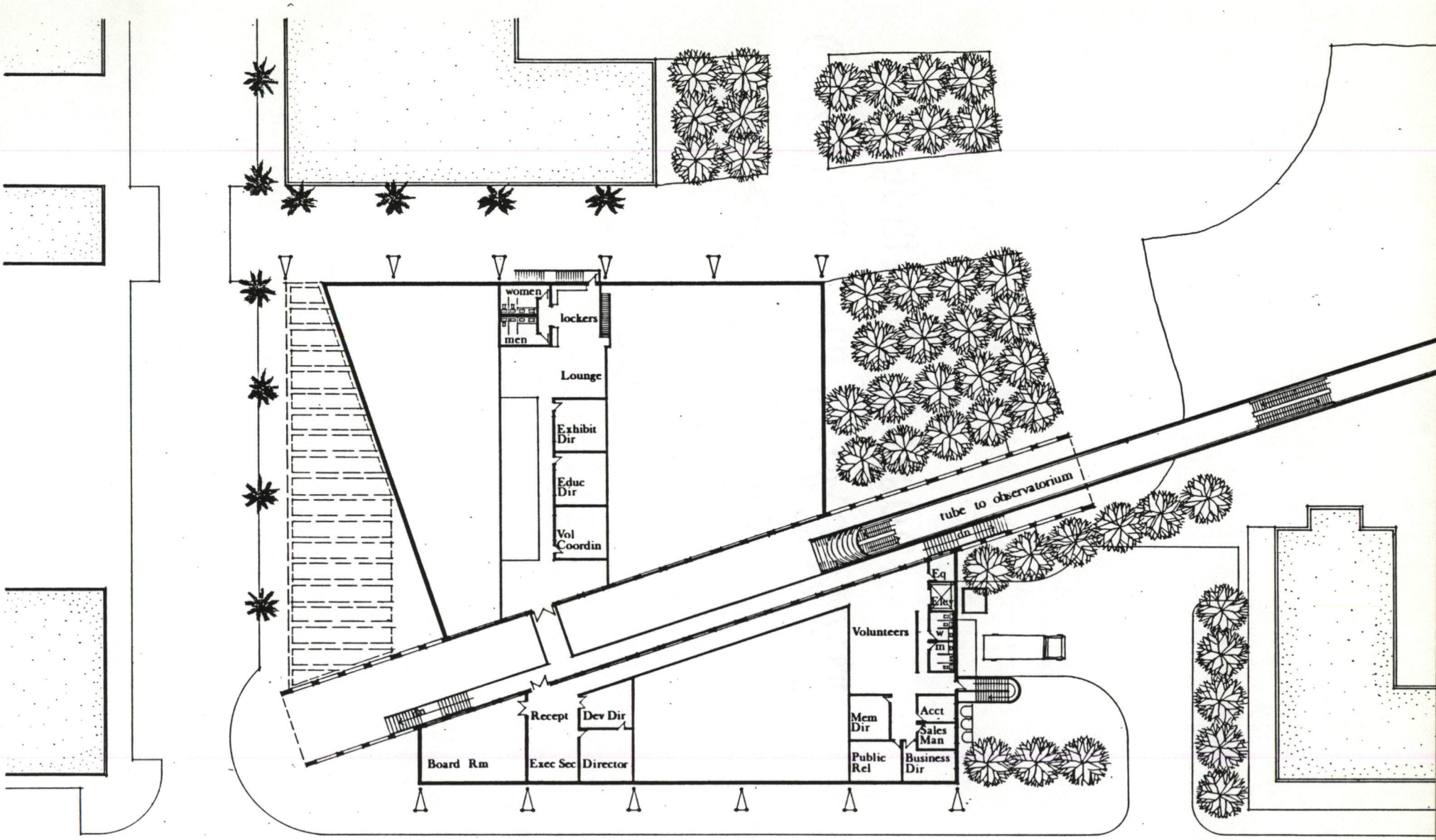

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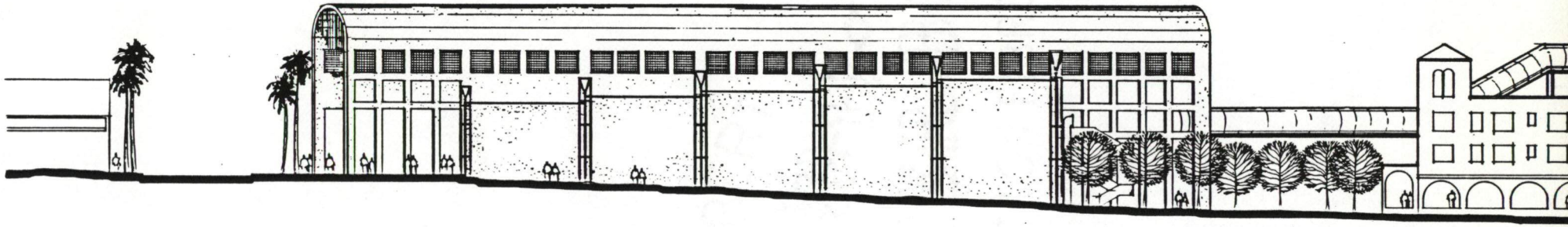

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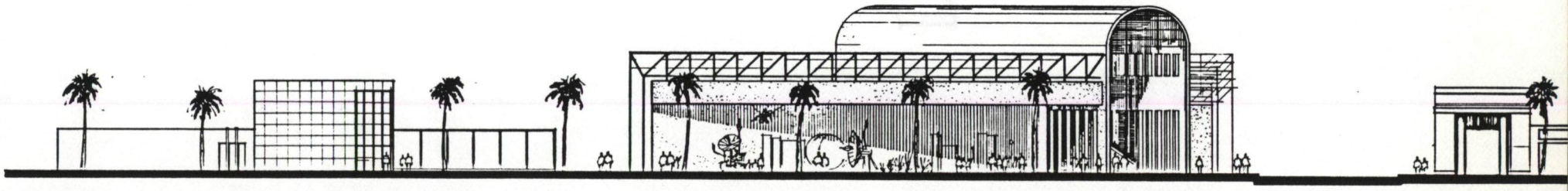

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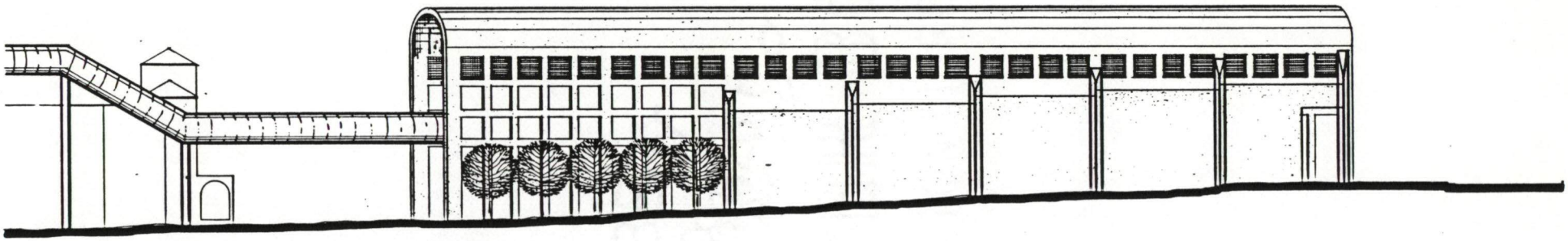

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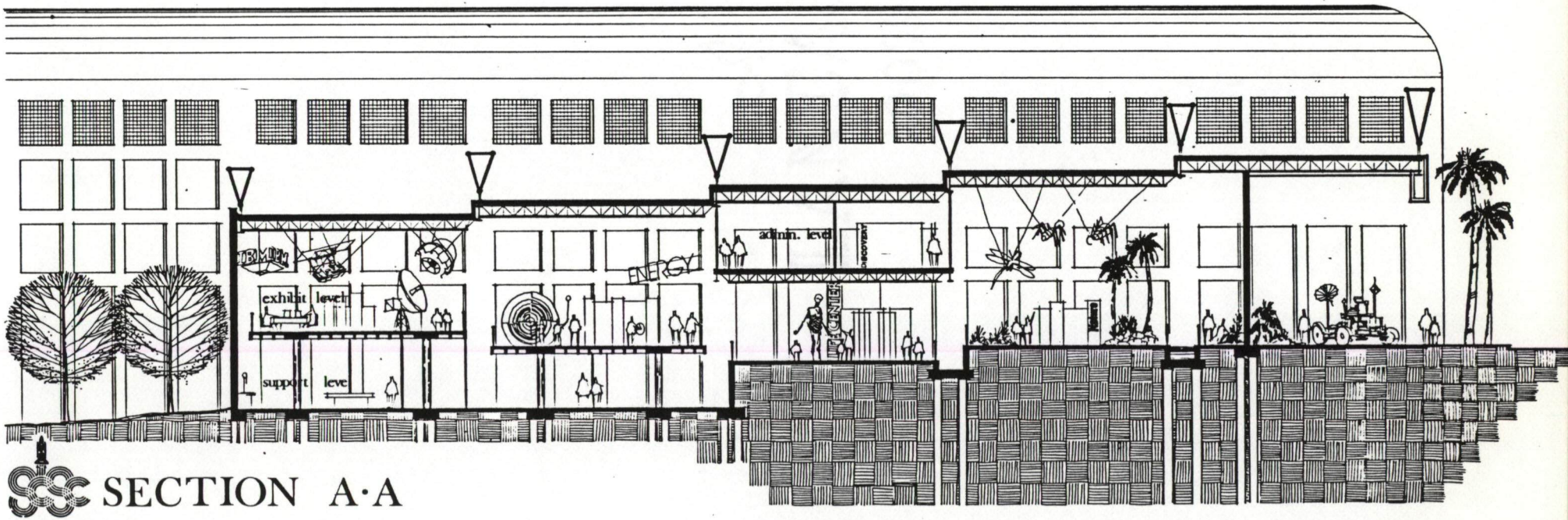

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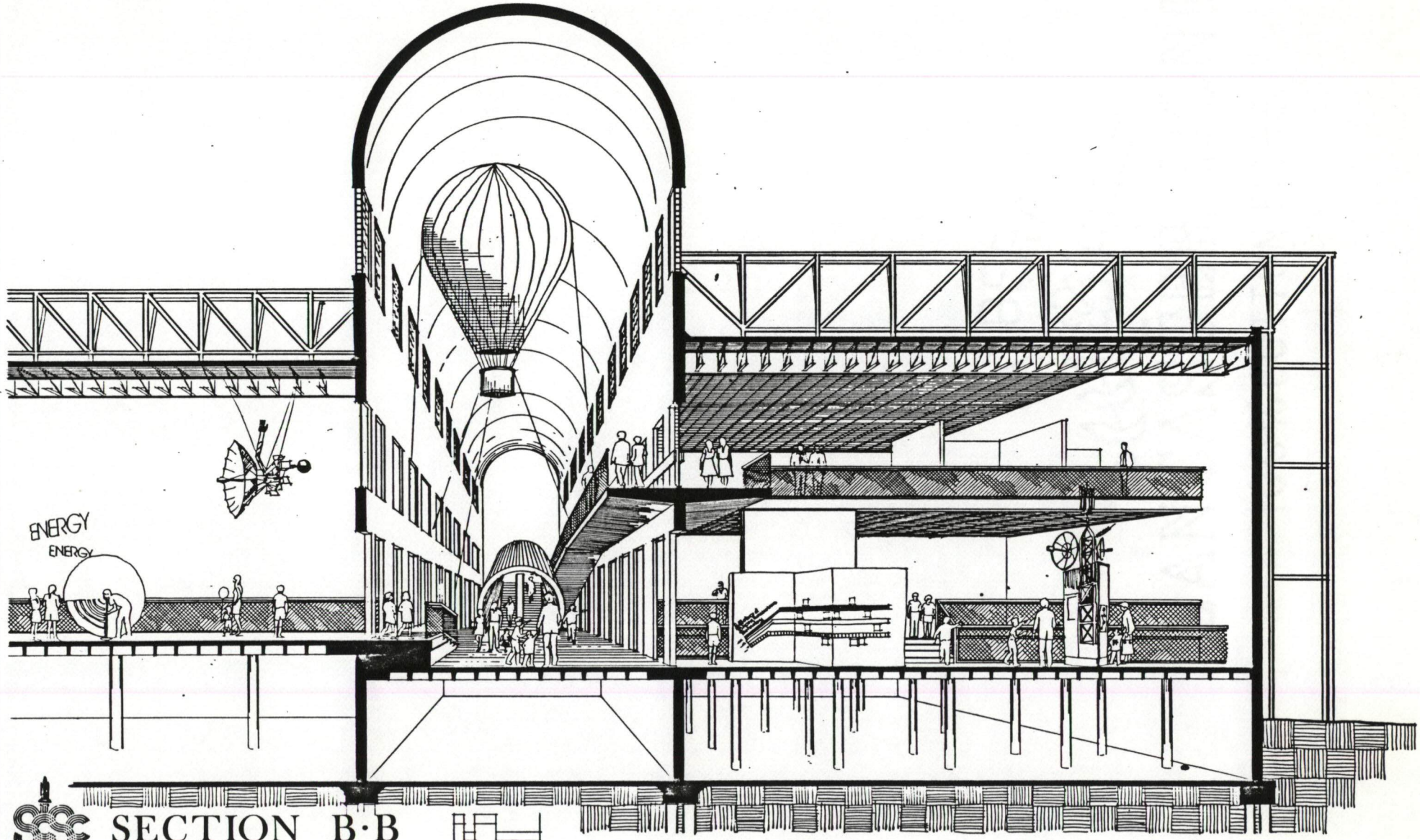

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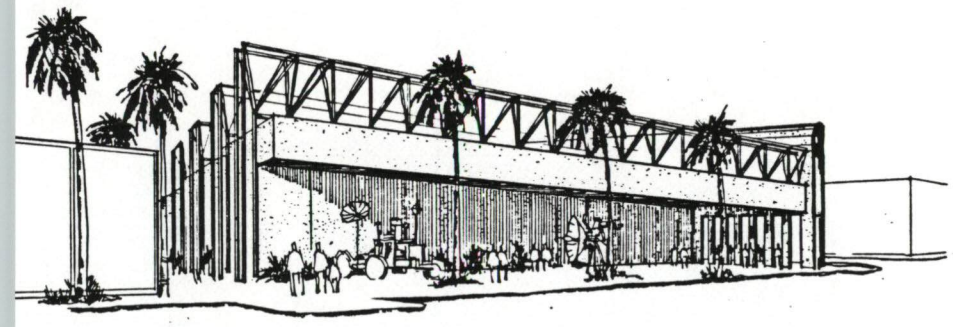

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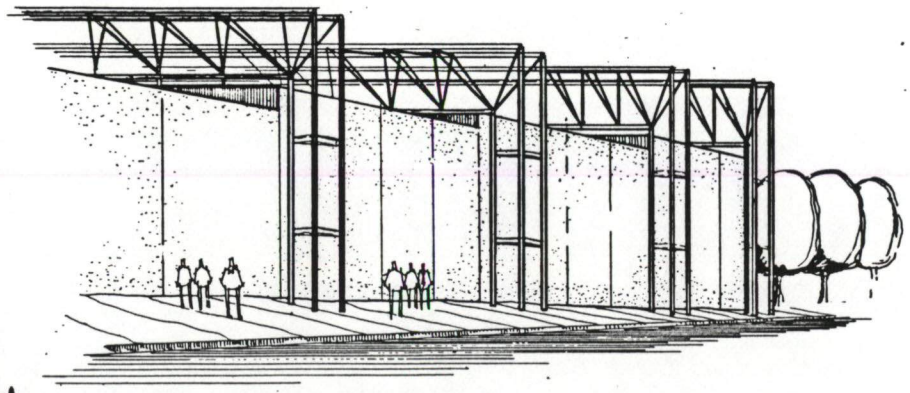

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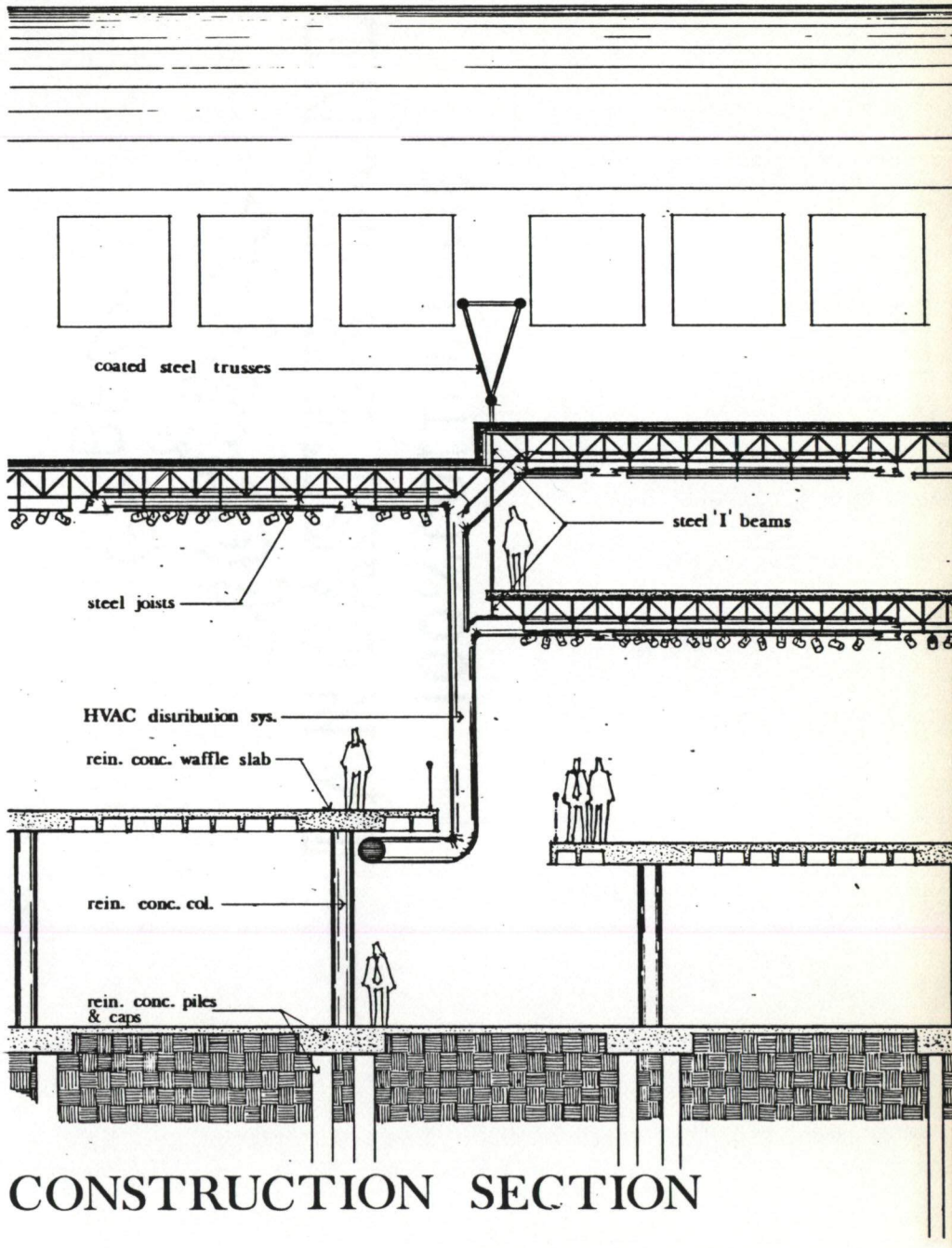

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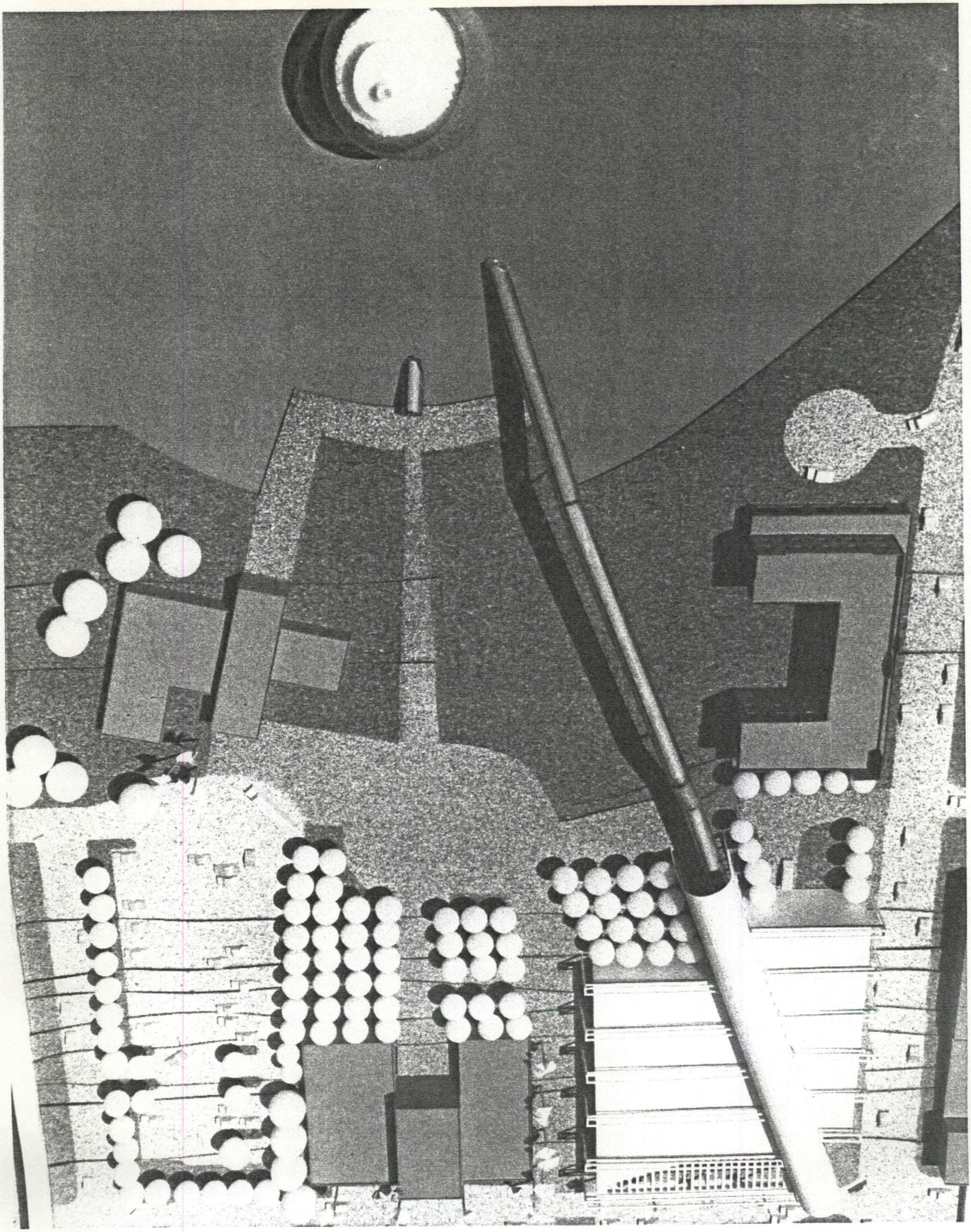

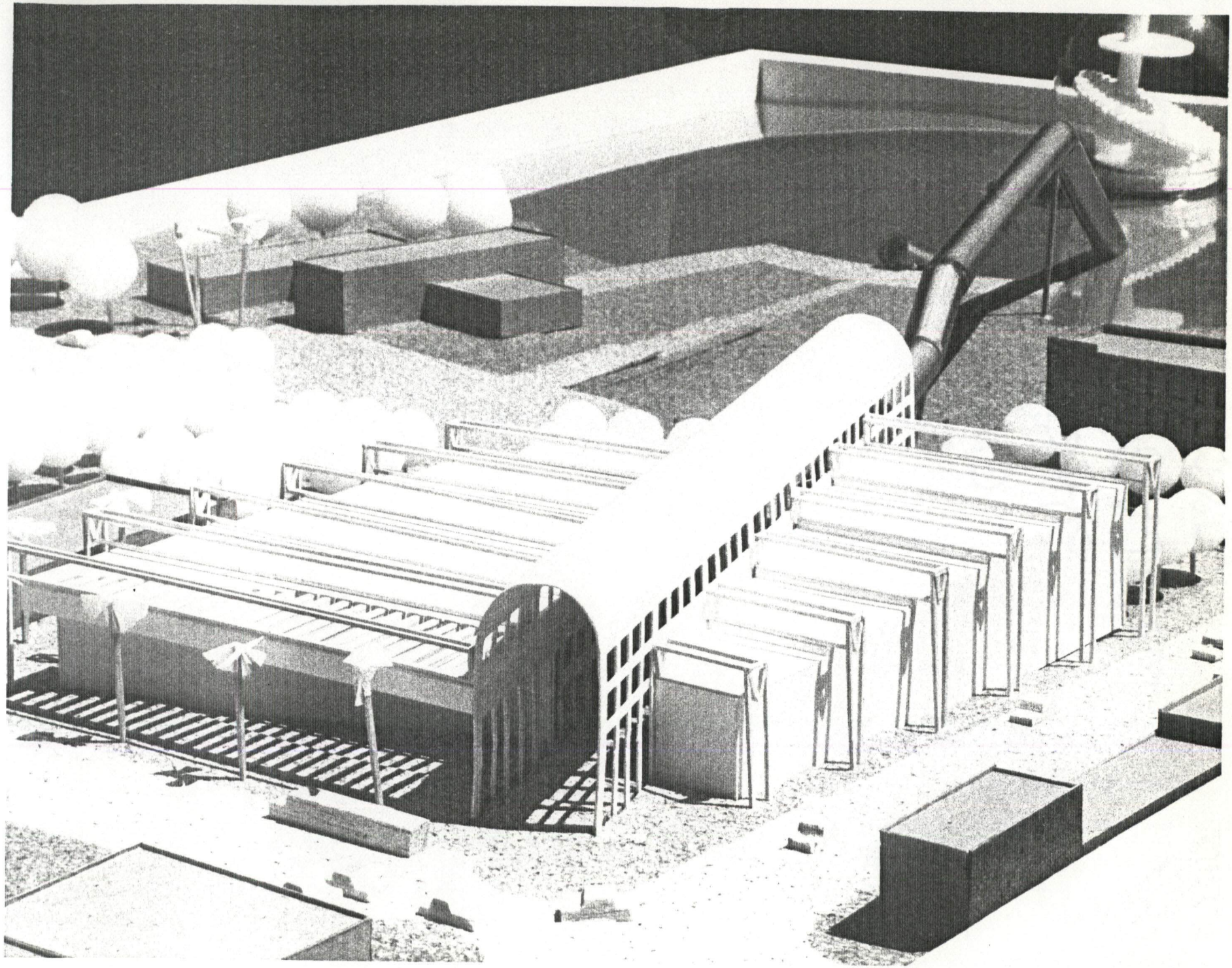

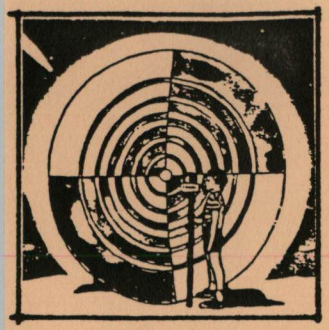

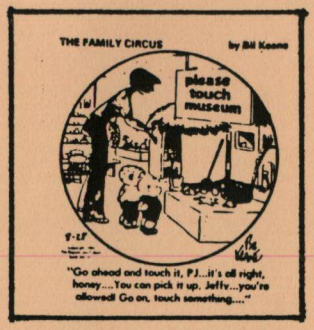

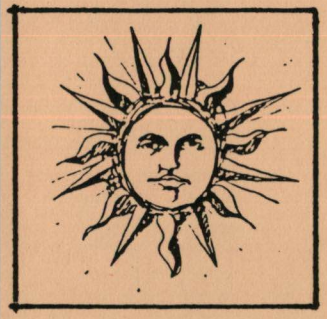

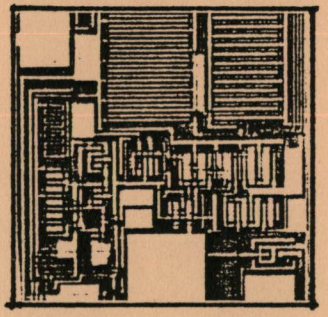

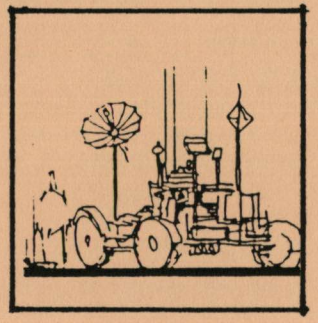

NOTES AND BIBLIOGRAPHY

FOOTNOTES

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2. Ibid., p.5.

3. Ibid., p.3.

4. **Economic Profile: South Brevard County, 1985-86 edition.** (Melbourne Area Committee of 100). p.1.

5. Ibid., p.1.

6. Ibid., p.1.

7. McLaughlin, Peggy. "Industries open door for growth," **The Orlando Sentinel.** Tuesday, March 20, 1984.

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9. Ibid., p.4.

10. Ibid., p.4.

11. Ibid. p.5.

12. Sverdrup and Parcel and Assoc., Inc. **Market Study for a Multipurpose Facility in South Brevard County.** (Community Foundation of South Brevard, July 1983). p.6.

13. Taylor, Lisa, ed. "Reclaiming Our Waterfronts," **Urban Open Spaces.** (New York: Rizzoli, 1981).

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FOOTNOTES

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13. "Reclaiming Our Waterfronts," **Urban Open Spaces.**